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NOTES ON NEOTROPICAL COMPOSITAE, I

José Cuatrecasas

The following descriptions, nomenclatural transfers, synonymic concepts and other comments refer to the Astereae, especially to Conyza, and are extracted from my manuscripts for the Flora of Colombia in preparation. The genus Conyza is considered here as defined by Cronquist in Brittonia 7:629-632 1943. The work upon which this paper is based has been sponsored by the National Science Foundation.

Key to the Colombian species of Conyza:

1. Flores feminei capillari-tubulosi.
   2. Pappus duplex, exterior minutis pilis coronam formantibus. Plantae lanatae vel lanuginosae. Sec. Laennecia.

      3. Capitula angusta subturbinata 4-5 mm alta 8-9 mm diametentia (expansa), involucro 4 mm alto bracteis anguste lineari-lanceolatis pallide viridibus vel brevissime violaceis, floribus femineis 42-46. Achaenia dense villoso - hispidula. Pappus pilis exterioribus conformibus 0.8-1 mm longis. C. filaginoides (DC.) Hier.

      3. Capitula semiglobosa 5-6.5 mm alta 11-15 mm diametentia (expansa), involucro 4-5 mm altum bracteis late lanceolatis sursum purpuraceis, floribus femineis circa 100. Achaenia margine dense ciliata faciebus tantum ad medium parce hispidulis. Pappus pilis exterioribus minutissimis saepe dilatato-squamulosis 0.2-0.3 mm longis. C. gnaphalioides HBK.

   2. Pappus simplex, pilis uniseriatis. Plantae haud lanatae. Sec. Conyza

      4. Planta virgato-ramosa hirtula plus glandulosa, thyrsoideo-floribunda. Folia pinnatipartita 1-4 cm longa segmentis linearibus. Capitula parva subturbinata 3-4 mm alta 75-110 floribus femineis, corolla ☿ limbo imfundibuliformi. C. sophiaefolia HBK.

      4. Planta eglandulosa. Folia serrata crenata vel integra.
         5. Herba rosulata vel subrosulata subscapifera hispidula-hirsuta inflorescentia laxa paucicapitulata (3-12 capitulis). Folia repando dentato-crenata vel integra, basilaria 5-20 cm longa. Capitula 6-8 mm alta 15-18 mm lata (expansa) semigloboso-

campanulata circa 380 floribus femineis, corolla ☿ limbo stricte tubuloso. C. chilensis Spreng.

5. Herba annua stricta erecta parce hispidula. Folia serrata vel integra oblonga 1-6 cm longa. Panicula corymbosa mediocris vel brevis. Capitula minuta semigloboso-campanulata 2.5-3 mm alta circa 100 floribus femineis. Corolla ☿ limbo infundibuliformi. C. microcephala Hemsl.

1. Flores feminei minute ligulati. Sec. Coenotus.

6. Herba suffruticosa hirsuta foliis pinnatipartititis segmentis linearibus. Capitulum semiglobosum 5-5.5 mm altum 110-160 floribus femineis. Corolla ☿ tubo stricte tubuloso. Ovarium dilute adpresse villosum. C. cardaminifolia HBK.

6. Herba annua vel perennis foliis integris dentatis vel lobatis.

7. Herba plus minusve lanata pilis longis tenuibus flexuosis intricatis. Proles albo-lanatae. C. prolialba Cuatr.

7. Herba hispida hirsuta vel villosa.

8. Herba annua erecta stipitato-glandulosa et hirsuta. Capitula 6 mm alta 170-300 floribus femineis. C. trihecatactis (Blake) Cuatr.

8. Herba haud glandulosa.

9. Herba basi suffrutescens parce hispidula vel glabra raro hirsuta ramis simplicibus erectis extremo panicula modesta subcorymbosa congesta vel laxa. Involucrum 4.5-6 mm altum plerumque violaceum. Flores feminei 50-140 (excep. 244 in var. hirsuta). Capitula 5-7 mm alta 10-14 mm lata (expansa). C. uliginosa (Benth.) Cuatr.

9. Herba annua simplex.

10. Herba plerumque flexuosa vel erecta pilosa foliis inferioribus et mediis oblonge obovatis vel spathulatis. Inflorescentia laxe corymboso-paniculata. Involucrum circa 3.5 mm altum 200-240 floribus femineis. Capitula circa 4 mm alta 7-9 mm lata (expansa). Ovarium dilute adpresse villosum. C. apurensis HBK.

10. Herba erecta plerumque robusta foliis lanceolatis vel lineari-lanceolatis vel linearibus, sursum ramis fastigiatis thyrsoideo-floribunda.

11. Capitula 3-5 mm alta 7-8 mm diametro (expansa) 40-50 floribus femineis. Involucrum plerumque glabrum vel subglabrum bracteis viridi-pallidis linea media prominula glandulosa. Corolla ☿ limbo tubuloso. Ovarium glabrum vel subglabrum. *C. canadensis* L.

11. Capitula 5-7 mm alta, 10-15 mm diametro (expansa) 60-120 floribus femineis. Involucrum plerumque hirsutum vel villoso-hirsutum. Corolla ☿ limbo tubuloso-infundibuliformi. Ovarium sparse villosum. *C. bonariensis* (L.) Cronquist.

CONYZA PROLIALBA Cuatr., sp. nov.

Herba annua vel perennans radice fusiformi ramulosa; planta vernalis vel juvenilis parva pulvinata 2-5 cm alta basi ramosa, ramis numerosis congestis densissime foliosis, foliis dense crasseque indumento albo lanato vestitis apicibus ramulorum sterilium flocoso-lanatis; adulta ad 60 cm alta caule simplex vel basi ramoso, caulibus ramisque erectis teretibus vel leviter striatis sparse glanduloso-pilosis et plus minusve lanuginosis pilis longissimis tenuibus flexuosis intricatis.

Folia membranacea pallide viridia copiosa; juvenilia in ramulis sterilibus lamina ovata vel elliptica lobata basi in longum petiolum planum nervatum subscariosum producta lobis 4-5 obtusiusculis circa 2 mm longis ascendentibus, untringue albo-lanata pilis stipitato-glandulosis brevibus et pilis longis lanuginosis dense tecta, 5-12 mm longa 4-10 mm lata, petiolo 8-20 mm longo circa 1.5 mm lato basi ampliato subamplectenti. Folia caulina inferiora vel media sessilia oblonga extremo plus minusve ampliato margine grosse lobato-serratia dentibus oblongis longiusculis acutisculis vel obtusiusculis mucronulatis basim versus integra basi dilatata amplexicaulia rotundato-auriculata utrinque dilute glandulosa et pilis longis lanosis copiosis praedita; sursum folia gradatim magis integra basi ampliora ovata rotundato-amplexicaulia suprema integerrima acutiuscula vel obtusiuscula mucronulata; omnia margine plus minusve revoluto crispoque, nervo medio subtus prominenti, nervulis lateralibus parcis ascendentibus venulisque laxis obsoletis, 1.5-5 cm longa 0.5-1 cm lata. Capitula 1-5 breviter pedicellata vel subsessilia in axillis foliorum glomerata, glomerulis secundum ramorum saepe pseudospicas elongatas formantibus cujasque numerosas paniculam compositam pyramidatam saepe valde floribundam formantes; folia (bracteae) subtendentia viridia ovato-lanceolata auriculato-amplectentia integra margine recurvata costa subtus prominenti glomerulos excedentia vel aequilonga. Pedicelli teneri 0.5-4 mm longi tenuiter lanuginosi, bracteolis subtendentibus linearibus 5-8 mm longis 1-1.5 mm latis.

Capitula circa 5 mm alta semigloboso-campanulata circa 6-7 mm lata (expansa 11-12 mm). Involucrum pallide viride vel purpurascens 4.5-5 mm altum, bracteis 3-seriatis lance-linearibus acuminatis dorso dilute stipitati-glandulosis et longe flexopilosis margine late scariosis eroso-ciliatisque, interioribus 4-4.5-5 mm longis 0.6-0.8 mm latis exterioribus 3.5 mm longis.

Flores radii feminei ligulati 200-260; corolla minute ligulata tubulo capillari 3-3.5 mm pappum aequilonga vel leviter excedenti sursum minute pilosulo apice leviter ampliato oblique truncato-aperto laminam amplectentem oblongo-ellipticam integram vel minutissime emarginatam 0.5 mm longam formanti. Rami styli stricti lineares circa 0.7-0.8 mm longi corollam excedentes.

Flores centrales hermaphroditi 10-20; corolla lutea circa 3.2-4 mm longa tubulo angusto sursum minute pilosulo circa 2.4-2.8 mm longo limbo campanulato dentibus oblongis acutiusculis 0.7-0.8 mm longis sparsissimis pilis longis tenuibus. Antherae circa 0.9 mm longae basi rotundatae apice anguste apiculatae. Rami styli robusti 0.7 mm longi oblongi apice sublanceolato extus dimidia superiore parte papilloso-hispiduli.

Ovaria elliptico-oblonga utrique rotundata complanata margine nervata glaberrima 1.1 mm longa. Pappus 3 mm longus albidus pilis tenuibus strigulosis uniseriatis, deciduis fragilibus. Receptaculum 2-2.5 mm diamitens alveolatum marginibus alveolorum dentatis.

Type: Colombia, Magdalena: Sierra Nevada de Santa Marta, valley descending southwestern from Picos Reina and Ojeda: rocky and meadowy paramos around Laguna Naboba, Laguna Mamo, 4200-4300 m alt. Adult leaves light green or lanuginous whitish; involucre light green or the tips more or less dark; young plants densely white-wooly. October 4, 1959, coll. J. Cuatrecasas & R. Romero Castañeda 24595 (Holotype, US; Isotype COL).

Other specimens examined: Sierra Nevada de Santa Marta, southeastern slopes: Hoya del Río Donachuí: Meollaca (or Meuyaca), rocky páramos about 3400 m alt. Leaves light green; involucre light green. October 8, 1959, coll. J. Cuatrecasas & R. Romero Castañeda 24627 (Paratype US). Sierra Nevada de Santa Marta, southeastern slopes: Hoya del Río Donachuí: Laguna de Calocribe (eastern of Meolloca), páramo 3600-3700 m alt. Leaves grayish whitish green; involucre very light green, becoming purplish, florets yellow. September 30, 1959, coll. J. Cuatrecasas & R. Romero Castañeda 24522 (US). Sierra de Perijá, eastern of Manaure: Quebrada de Floridablanca, Andean forest and bushes, 2700-2800 m alt. Pale green herb; Corollas white. November 12, 1959, coll. J. Cuatrecasas & R. Romero Castañeda 25260 (US).

Conyza prolialba is closely related to C. mima Blake from Venezuela, but differs by having always ligulate ray flowers and glabrous achenes, and by being a larger plant. From the

Central American *Erigeron subspicatus* Benth., the new species differs by its glabrous achenes and more abundant indument both representing probably only vicariant varieties of the same species; however, the Bentham epithet is already used for another species of *Conyza*.

CONYZA PROLIALBA var. SUBSPICATA (Benth.) Cuatr., comb. nov.
Erigeron subspicatus Benth. in Oerst. Kjoeb. Vidensk. Meddel. 82. 1852

CONYZA TRIHECATACTIS (Blake) Cuatr., comb. nov.
Erigeron trihecatactis Blake, Journ. Wash. Acad. Sci. 27: 380. 1937.

CONYZA ULIGINOSA (Benth.) Cuatr., comb. nov.
Erigeron uliginosus Benth., Pl. Hartw 204. 1845.
Erigeron popayanensis Hieron., Bot. Jahrb. Engl. 28:586. 1901.
Erigeron sulcatus var. *columbianus* Hieron., Bot. Jahrb. Engl. 28:586. 1901.
Erigeron uliginosus var. *hirsutus* Hieron., Bot. Jahrb. Engl. 28:587. 1901.
Erigeron bonariensis var. *meridensis* Cuatr., Trab. Mus. Nac. Cienc. Nat. Jard. Bot. Madrid, Ser. Bot. 33:132. 1936.

CONYZA ULIGINOSA var. COLUMBIANA (Hieron.) Cuatr., comb. nov.
Erigeron sulcatus var. *columbianus* Hieron., Bot. Jahrb. Engl. 28:586. 1901.

Folia caulina anguste linearia, 1-2 mm lata. Inflorescentiae plerumque laxiores pedicellis gracilioribus.

CONYZA ULIGINOSA var. HIRSUTA (Hieron.) Cuatr. comb. nov.
Erigeron uliginosus var. *hirsutus* Hieron., Bot. Jahrb. Engl. 28:587. .1901.

Caules folia inflorescentiaeque densiuscule longeque albidohirsuti.

CONYZA BONARIENSIS var. LEIOTHECA (Blake) Cuatr., comb. nov.
Erigeron bonariensis var. *leiothecus* Blake Contr. Gray Herb. 52:28. 1917.
Conyza floribunda HBK, Nov. Gen. Sp. Pl. 4:73. 1820.

ERIGERON CHIONOPHILUS var. LEPTOPHYLLUS Cuatr., var. nov.

Herba caespitosa rhizomate verticale vel obliquo ramoso ramis erectis cum vaginis foliorum vetustorum tectis denique nudis apice folia rosulato-fasciculata congeste ferentibus.

Folia anguste lanceolato-linearia vel linearia apice acuta basim versus sine sensu longeque attenuata supra basim in vaginam ampliata 3-4 cm longa 1-2 mm lata, nervo medio tantum aliquando paulo conspicuo undique villoso-hirta pilis rigidis patulis vel subpatulis longis acutis basi incrassatis copiosis tecta.

Capitulum 1.5 cm diamitens campanulatum. Involucrum circa 1.3 cm altum bracteis herbaceis viridibus 4-seriatis subaequilongis lineari-subulatis acuminatis interioribus 11 mm longis ad basim 1-1.2 mm latis margine scariosis eroso-ciliatisque dorso villosis pilis longis subpatulis flexuosis, exterioribus 10 mm longis similibus. Flores radii feminei 3-4 seriati involucrum attingentes vel breviores, corolla ligulata alba circa 8 mm longa tubulo capillari 3 mm longi glabro vel subglabro lamina lineari apice minute 2-3 dentata vel integra 0.4 mm lata, ramis styli linearibus subobtusis subcompressis minute papillosis 0.8 mm longis, pappo 3.5-4 mm longo pallide stramineis pilis inaequilongis basi coalitis strigosis sub-biseriatis exterioribus vel subexterioribus minutis (0.1-0.3 mm longis) squamulosis, ovario oblongo sublaeve glabro vel praecipue sursum sparsis pilis 2 mm longo. Flores disci hermaphroditi circa 50, corolla 4.5-5 mm longa parce pilosa parte media tubulo 2-3 mm longo limbo tubuloso-campanulato dentibus 0.8-0.9 mm longis triangulari-oblongis acutiusculis, antheris 1.8 mm longis basi minute auriculatis ramis styli 0.8 mm longis oblongis subcompressis obtusiusculis extus sursum papilloso-pilosis deorsum gradatim minus papillosis margine papilloso-stigmatico, ovario 1 mm longo glabro vel parcissimis pilis, pappo cum in femineis.

Varietas a specie folia anguste linearia bracteae angustiores differt.

Type: Colombia: Santander: "cumbres montañosas a 2800 m alt., a 2 km del paraje Berlin; flores blancas; suelo seco, arcilloso". 18-XII-1948, Araque & Barkley 18S409 (Holotype, US).

ERIGERON WEDDELLIANUS Hieron. ex Sodiro, Bot. Jahrb. Engl. 19: 49. 1894; 29:21. 1900.

Erigeron spathulatum Wedd., Chl. And. 1:197. 1857. Not *E. spathulatus* Vahl. 1793.

Erigeron ecuadoriensis Hieron., Bot. Jahrb. Engl. 21:336. 1895.

Erigeron Weddellianus var. *rosuloides* Cuatr., An. Univ. Madrid, 4(2):218 (reprint pag. 15). 1935.

Erigeron Caldasii Cuatr., Trab. Mus. Cienc. Nat. Jard. Bot. Madrid, Ser. Bot. 29:23, fig. 6. 1935.

In 1894 Hieronymus described very briefly and imperfectly *Erigeron Weddellianus*, based on a specimen found among collections of *Erigeron pellitus* (=*Oritrophium peruvianum*) in the Paris herbarium. The same Hieronymus, in 1900 indicated the type (Jameson 273) of his species by identifying it with the well known *Erigeron spathulatum* Weddell (not Vahl).

ORITROPHIUM HIRTOPILOSUS (Hieron) Cuatr., comb. nov.

Erigeron hirtopilosus Hieron., Bot. Jahrb. Engl. 21:336. 1895.

Type: Stuebel 48 i. Photo F.M. 14844. Specimen examined: Mathews, 1862, "Peruvia" (US. 245951). This specimen agrees

perfectly with the description and photograph of type.

BACCHARIS INCARUM (Wedd.) Cuatr., stat. nov.

Baccharis microphylla β *incarum* Wedd. Chlor. And. 1:170. 1856.

The type (P) was collected by Weddell in the Cordillera de Tacora, Peru. Paratypes came from Potosi, La Paz, Lago Titicaca near Tioguanaco (collect. Weddell, Orbigny, Pentland). The Peruvian specimens; Macbride & Featherstone 474 from Matucana and Macbride & Featherstone 2502 from Pomopampa, distributed as *B. intermedia* DC. belong to *B. incarum*, which is very different from *B. intermedia*.

NOTES ON NEW AND NOTEWORTHY PLANTS. XXXIV

Harold N. Moldenke

LANTANA MACROPODA f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having the corollas white with a yellowish eye.

The type of the form was collected by Cyrus Longworth Lundell (*no. 14517*) in the Yeager Pasture of the South Texas Syndicate Ranch, in the vicinity of Experimental Garden, La Salle County, Texas, on October 15, 1945, and is deposited in the Lundell Herbarium at the Texas Research Foundation, Renner, Texas.

LIPPIA INOPINATA Moldenke, sp. nov.

Frutex; ramulis gracilibus tetragonis subadpresso-villosis, pilis antrorsis griseis; foliis parvis subcoriaceis ovato-ellipticis saepe falcato-conduplicatis ad apicem basinque acutis, margine grosse serratis, dentis antrorsis, supra parce villosis bullato-lineatis, subtus densiuscule villosis; inflorescentiis axillaribus solitariis simplicibus.

Woody shrub; stems tall, woody, gray, glabrous, subterete; branchlets slender, brownish, obtusely tetragonal, villous with subappressed antrorse grayish hairs; principal internodes much abbreviated, 8--21 mm. long; leaves decussate-opposite; petioles very short, 2--5 mm. long, densely whitish-villous with long antrorse hairs; leaf-blades subcoriaceous, rather uniformly grayish-green on both surfaces, ovate-elliptic, often falcate-conduplicate, small, 2--3 cm. long, 1--1.5 cm. wide, acute at the base and apex, coarsely serrate along the margins with antrorse sharply acute teeth, rather sparsely villous and bullate-lineate above, more densely gray-villous beneath; midrib and secondaries deeply impressed above and sharply prominent beneath; veinlet reticulation more or less subimpressed above and slightly prominulous beneath; inflorescence axillary, crowded near the apex of the twigs, equaling or slightly surpassing the subtending leaves, solitary in each axil; peduncles filiform, 1.5--2.3 cm. long, densely spreading-villous; heads subglobose, yellowish, about 1.5 cm. long and wide, densely many-flowered; bracts papery, subobtuse at the apex, densely pubescent on both surfaces.

The type of this species was collected by Howard Scott Gentry (no. 18267) in an Opuntia thicket on a rocky slope in cactus-acacia association, altitude 6200 feet, Villa Nueva, Zacatecas, Mexico, on November 29, 1959, and is deposited in the C. L. Lundell Herbarium at the Texas Research Foundation, Renner, Texas.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. IX

Harold N. Moldenke

VERBENA CATHARINAE Moldenke

Inflorescence rather few-flowered; peduncles very slender, about 2 cm. long, sparsely hirsute; bractlets lanceolate, 2--3 mm. long, attenuate-acute at the apex, hirsutulous especially on the margins; calyx cylindric, about 8 mm. long and 1--1.5 mm. wide, hirsutulous-pubescent, some of the hairs capitate-glandulose; corolla blue, hypocrateriform, its tube about 11 mm. long, puberulous on the outside above the calyx, its lobes also pilosulous-puberulous beneath.

The type of this species was collected by my good friend, Padre Raulino Reitz (no. C.1561) on a campo at Taimbesinho, altitude 900 meters, Araranguá, Santa Catarina, Brazil, on February 15, 1946, and is deposited in the Barbosa Rodrigues Herbarium at Itajai, Brazil. The species is said to be a ruderal one and has been found on campos and rock outcrops, growing at from 760 to 1200 meters altitude, in flower in February, October, and December. Vernacular names recorded for it are "camaradinha", "formosa sem dote", and "jurupeba", names which are apparently given to many other species of the genus in Brazil.

In all, 10 herbarium specimens, including the type, have been examined by me.

Citations: BRAZIL: Paraná: Hatschbach 3363 (Z). Santa Catarina: Reitz C.1561 (N--isotype, Rd--2121--type); Smith & Klein 8055 (Ok, W--2251336), 11403 (Ok, W--2251777); Smith & Reitz 8917 (Ok, W--2251467); Smith, Reitz, & Sufridini 9561 (W--2249363).

VERBENA CHACENSIS Moldenke, Phytologia 5: 228--229. 1955.

Bibliography: Moldenke, Phytologia 5: 228--229. 1955; G. Taylor, Ind. Kew. Suppl. 12: 149. 1959; Moldenke, Résumé 494 & 495. 1959; Moldenke, Résumé Suppl. 1: 7 & 25. 1959.

Herb, 40--50 cm. tall; stems simple or branching into two at the base, tetragonal, deeply sulcate between the angles, densely short-pubescent with erect mostly glanduliferous hairs, less densely so toward the base; principal internodes 3--5.5 cm. long; leaves decussate-opposite, sessile, elliptic or narrow-elliptic, 6--7 cm. long when mature and 1.5--2.5 cm. wide, the upper ones much narrower and oblong, often recurved, acute at the apex, cuneate-acuminate to the amplexicaul base, sharply and irregularly serrate from above the cuneation to the apex, scabrous and obscurely short-pubescent above, more densely short-pubescent with glanduliferous hairs beneath; midrib slender, impressed above, very prominent beneath; secondaries slender, about 4 per side, ascending, not arcuate, ending in the teeth, impressed above, very prominent beneath; veinlet reticulation very abundant and conspicuous, impressed above and very prominent beneath; inflorescence terminal. spicate, usually with one shorter side-branch, densely many-flowered; peduncles similar to the stems in texture and pubescence, about 9.5 cm. long, with a gall-like globular protuberance above the mid-point; floriferous portion of the spikes 3--8 cm. long, the upper flowers densely overlapping, the lower fruits more distant; rachis densely short-pubescent with brownish glanduliferous hairs like the stems; bractlets lanceolate, about 4 mm. long, equaling or slightly surpassing the calyx, pilose on the back, ciliate-margined; calyx tubular, about 3 mm. long, strigillose, its rim minutely 5-toothed; corolla about 4.5 mm. long, its limb 2 mm. wide.

The type of this species was collected by Teodoro Rojas [Hassler 2459] at Lomal Clavel, latitude S.23°20', in the Gran Chaco, Paraguay, in November, 1903, and is deposited in the herbarium of the University of California at Berkeley. The species is known from only the type collection. Only 2 specimens, including the type, have been examined by me.

Citations: PARAGUAY: T. Rojas s.n. [Hassler 2459] (Ca--929435-type, Z--isotype).

VERBENA CHEITMANIANA Moldenke, Phytologia 2: 420--421. 1948.

Bibliography: Moldenke, Phytologia 2: 420--421. 1948; Moldenke, Castanea 13: 118--119. 1948; Moldenke, Alph. List Cit. 4: 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 197. 1949; Moldenke, Phytologia 3: 135. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Phytologia 5: 24. 1954; Moldenke, Résumé 127 & 471. 1959; Moldenke, Résumé Suppl. 3: 14. 1962.

Sprawling herb; stems often procumbent, very slender, elongate, acutely tetragonal, strigillose or glabrescent; branches rather few, very slender, elongate, sprawling, acutely tetragonal, often slightly sulcate between the angles, rather densely strigillose with very short and whitish reflexed hairs; nodes annulate; principal internodes 1.5--7.5 cm. long; leaves decussate-opposite, apparently often numerous only toward the tips of the branches; petioles slender, 1--1.5 cm. long, margined, densely pilose-pubescent with subappressed, whitish, antrorse hairs; leaf-blades membranous, somewhat lighter green beneath, not brunnescent in drying, triangular-ovate in outline, 1.5--4 cm. long, 1--3 cm. wide, attenuate-acute at the apex (or merely acute on smaller leaves), cuneately acuminate into the petiole at the base, irregularly incised, often more or less distinctly 3-lobed, appressed-strigillose on both surfaces, more densely so when immature, the lobes entire or more usually incised, the teeth all acute at the apex; midrib and the 1--3 pairs of secondaries very tenuous, plane or obscure above, very slightly prominulous beneath; veinlet reticulation indiscernible above, obscure beneath; inflorescence terminal and in the uppermost leaf-axils, the floriferous portion congested-spicate, densely many-flowered, apparently 2--3.5 cm. long, showy; peduncles very slender, 6--10 cm. long, rather obtusely tetragonal, sometimes slightly sulcate, stramineous, fairly densely short-pilose or strigillose with whitish reflexed hairs; bractlets lanceolate, 4--6 mm. long, about 1 mm. wide at the base, long-attenuate at the apex, rather densely strigose with antrorse white hairs; calyx cylindric, 8--9 mm. long, densely strigose with closely appressed, antrorse, white hairs, its rim unequally toothed, the teeth long-aristate, their tips connivent before and after anthesis, purplish; corolla violet or purple, its tube 10--11 mm. long, glabrous or very obscurely pilosulous above the calyx outside, villous at the throat within, the limb 7--8 mm. wide, patent, the lobes deeply cordate at the apex, glabrous on both surfaces.

The type of this most interesting species was collected by Robert E. Fries (*no. 477*) in shady places under *Salix humboldtiana* at Piquete, on the sandy banks of the Río San Francisco, Jujuy, Argentina, on August 21, 1901, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The species reminds one in the general appearance of its leaves of the North American *V. canadensis* (L.) Britton. It is named in honor of Philip Cheitman, American educator and ardent student of Nature, who has rendered considerable help to me in my researches on tropical and extra-tropical American plants.

The species has been found on hillsides as well as on sandy riverbanks, at altitudes of 450 to 3300 meters, blooming in February, April, and November. The Formosa, Argentina, record given by me in my Known Geogr. Distrib. Verbenac., [ed. 2], 105 (1949) and Résumé 127 (1959) was based on *Morel 1003* and *1214*, but these two collections are now regarded by me as representing *V. calliantha* Briq. The *Jörgensen 86* cited below could be from the provinces of Buenos Aires, Córdoba, Entre Ríos, San Luis, or Santa Fé, since there is a "Saladillo" locality in each of these provinces.

In all, 11 herbarium specimens, including the type, and 5 mounted photographs have been examined by me.

Citations: ARGENTINA: Catamarca: *Brucher & Brucher s.n.* [16/2/1949] (Lu). Jujuy: *R. E. Fries 477* (F--photo of type, N--isotype, N--photo of type, Pc--photo of type, S--type, S--isotype, S--isotype, Si--photo of type, Z--photo of type); *Schreiter 5149* [Herb. Osten 20012] (N, Ug); *Venturi 5132* (W--1591462). Salta: *Venturi 5329* (W--1591469). Tucumán: *Venturi 7785* (W--1591389). Province undetermined: *Jörgensen 86* [El Saladillo] (W--921685).

VERBENA CHILENSIS Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44, 78, & 101, hyponym (March 12, 1942); Lilloa 8: 429. 1942.

Synonymy: *Verbena glabrata* R. A. Phil., Anal. Univ. Chil. 35: 190--191 [Sert. Mendoc. Alt. 32]. 1870 [not *V. glabrata* H.B.K., 1818].

Bibliography: H.B.K., Nov. Gen. & Sp. Pl. 2: 276--277. 1818; R. A. Phil., Anal. Univ. Chil. 35: 190--191 [Sert. Mendoc. Alt. 32]. 1870; Jacks., Ind. Kew. 2: 1178. 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44, 78, & 101. 1942; Moldenke, Lilloa 8: 429 (1942) and 10: 382. 1944; Moldenke, Alph. List Cit. 4: 1080, 1172, & 1198. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 197. 1949; Moldenke, Phytologia 4: 71. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 127, 364, 419, & 471. 1959.

Semiprostrate shrub or suffruticose, completely glabrous throughout; branches 23--30 cm. long; upper internodes about twice as long as the leaves; leaves up to 26 mm. long and 15 mm. wide, the uppermost ones entire, the middle ones mostly simply 3-fid, cuneate at the base, with linear obtuse segments 2--3 mm. wide, the lowermost often with the lateral segments again divided into 3 small lobes; spikes exserted, capitate, many-flowered; bractlets lanceolate-subulate, shorter than the calyx; calyx 9--10 mm. long, glabrous; corolla yellow or yellow and purple or pale-purple, 21--23 mm. long, glabrous; anther-appendages clavate, exserted.

The type of this species was collected by Rudolf Amandus Philippi in Mendoza, Argentina, sometime in 1868 and is deposited in the herbarium of the Museo Nacional de Historia Natural de Chile in Santiago. Unfortunately, the label of Macbride's widely distributed photograph 17417 of an isotype does not show Philippi's original label and is erroneously inscribed "Chile" -- which is the basis for the misleading specific epithet which I chose for the species when it was discovered that Philippi's original epithet had to be discarded because it is a later homonym.

The *Gillies s.n.* [Mendoza] specimen cited below from the Lund herbarium is labeled as *Verbena flava* Gill. & Hook. in the same style and manner as are the actual isotypes of that species in the same herbarium, but its leaves are plainly 3-partite, *Carette 339* and *Sanzin 582* were previously misidentified as *V. flava*, while *Sanzin 855* was identified as *V. flava* with "*V. glabrata* Phil." given as a possible synonym. Philippi, however, states that his species is distinguished from *V. flava*, which also is glabrous and has yellow flowers, by its parted leaves, the corolla being twice as large, and by the thick club-shaped anther-appendages; from *V. radicans* Gill. & Hook. by its much less parted leaves, perfectly glabrous calyx, and other characters; and from all other species with which it could be compared by its glabrous condition.

V. chilensis has been found on mountain ridges above the barrel-cactus zone, in sandy places, and in quebradas, from 1480 to 3200 meters altitude, flowering from November to March, and fruiting in January. In all, 33 herbarium specimens and 5 mounted photographs, including phototypes of both names involved, have been examined by me.

Citations: ARGENTINA: Mendoza: *F. A. Barkley 20Mz072* (N); *H. H. Bartlett 19410* (W—1904486), *19487* (Mi, W—1907597); *Carette 339* (N), *s.n.* [Ruíz Leal 2563] (N); *Gillies s.n.* [Hornillos] (Bm), *s.n.* [Mendoza] (Lu); *O'Donell 1026* (N); *R. A. Philippi s.n.* [Mendoza; Herb. Mus. Nac. Hist. Nat. Chile 42446 & 54790; Macbride photos 17417] (Kr—photo of isotype, N—photo of type, N—photo of isotype, N—photo of isotype, N—photo of isotype); *Rossi 362* (N); *Ruíz Leal 3505* (N), *3628* (N), *4686* (N, Ss), *5367* (N), *7702* (N), *8584* (N), *8650* (Rl), *10489* (N), *11232* (Ss), *11674* (Z), *16964* (Ss); *Sanzin 582* [Herb. Osten 12807] (Ug), *855* [Herb. Osten 12808] (Ug), *s.n.* [Ruíz Leal 1410] (N), *s.n.* [Ruíz Leal 1411] (N); *Semper s.n.* [Ruíz Leal 4259] (N), *s.n.* [Ruíz Leal 10565] (Ss), *s.n.* [Ruíz Leal 11201] (Ss), *s.n.* [Ruíz Leal 13812] (Rl). Neuquen: *Fabris 842* (N); *O'Donell 2008* (Er, S).

VERBENA CILIATA Benth., Pl. Hartw. 21. 1839.

Synonymy: *Verbena candelabrica* W. Schum., in herb. *Verbena erinoides* H.B.K., in herb. [not *V. erinoides* Auth., 1959, nor Chod., 1904, nor Hook., 1959, nor Hook. & Arn., 1959, nor L., 1959, nor Lam., 1791, nor Poepp., 1847, nor Spreng., 1830].

Bibliography: Benth., Pl. Hartw. 21. 1839; Walp., Repert. Bot. Syst. 4: 30. 1845; Schau. in A. DC., Prodr. 11: 550 & 553. 1847; S. Wats., Proc. Am. Acad. Sci. 18: 136. 1883; Coult., Contrib. U. S. Nat. Herb. 2: 327—328. 1892; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks., Ind. Kew. 2: 1178. 1895; Small, Fl. Southeast. U. S., ed. 1, 1010. 1903; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 102. 1907; F. E. Lloyd, Carnegie Inst. Wash. Publ. 82: pl. 3. 1908; Small, Fl. Southeast. U. S., ed. 2, 1010. 1913; E. D. Schulz, 500 Wild Fls. 178. 1922; E. D. Schulz, Texas Wild Fls. 336—337. 1928; Seymour, Host Ind. Fungi N. Am. 587. 1929; Stapf, Ind. Lond. 6: 429. 1931; Perry, Ann. Mo. Bot. Gard. 20: 248, 249, 312, 325, 330—331, 336, & 355. 1933; J. A. Harris, Physico-chem. Prop. Plant Saps 49. 1934; L. H. & E. Z. Bailey, Hortus, new rev. ed., 632. 1935; L. H. Bailey, Cat. Florists Handl. Verbenac. mss. 1935; Sperry, Sul Ross Bull. 19: 68. 1938; Ranson, Texas Wild Fl. Legends 113. 1940; Sperry, Sul Ross Bull. 22: 41. 1941;

Worsdell, Ind. Lond. Suppl. 2: 486. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 18 & 43—44. 1942; H. S. Gentry, Carnegie Inst. Wash. Publ. 527: 221 & 306. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 7, 8, 11, 13, 14, 18, & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke, Am. Journ. Bot. 32: 610. 1945; Moldenke, Phytologia 2: 66, 79, 114, & 127. 1945; W. C. Leavenworth, Am. Midl. Nat. 36: 148 & 187. 1946; Moldenke, Alph. List Cit. 1: 4, 37, 53, 89, 104, 122, 126, 127, 136, 143, 144, 152, 216, 233, 244, 253, & 283. 1946; G. L. Fisher, Am. Bot. Exchange List 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 24. 1947; Moldenke, Phytologia 2: 328 & 331 (1947) and 2: 161. 1948; Moldenke, Wrightia 1: 234. 1948; Moldenke, Castanea 13: 112 & 114. 1948; Moldenke, Alph. List Cit. 2: 370, 439, 457, 467, 473, 475, 477, 479, 483, 497, 483, 497, 498, 506, 517, 522, 523, 525--527, 531, 540, 549, 588, 595--598, 607, & 626 (1948), 3: 656, 678, 697, 714, 730, 731, 740, 753—755, 767, 769, 772, 785, 787, 799, 802, 803, 828—831, 849, 871, 879, 881, 883, 898, 933, 934, 951, 963, & 973 (1949), and 4: 986, 991, 996, 997, 1002, 1003, 1014, 1072, 1075, 1082, 1108, 1121, 1148, 1153, 1158, 1160, 1166, 1169--1171, 1182, 1192, 1199, 1211, 1221, 1229, 1231, 1241, 1247, 1290—1292, 1294, 1295, & 1303. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 14, 16, 21, 23, 25--27, 32, 34, 36, & 197. 1949; Moldenke, Phytologia 3: 73 & 132. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 12. 1949; McDougall & Sperry, Pl. Big Bend Nat. Park 146. 1951; J. Rzedowski, Anal. Esc. Nac. Cienc. Biol. 8: 112. 1954; Moldenke, Inform. Mold. Set 49 Spec. 3. 1954; Moldenke, Phytologia 5: 95. 1954; J. Rzedowski, Anal. Inst. Biol. Mex. 27: 201. 1956; J. & G. C. de Rzedowski, Act. Cientif. Potos. 1: 39. 1957; Moldenke, Résumé 18, 20, 26, 29, 31, 33, 39, 40, 43, 364, & 471. 1959; J. Rzedowski, Act. Cientif. Potos. 4: 91. 1960; Lewis & Oliver, Am. Journ. Bot. 48: 639—641. 1961; Moldenke, Résumé Suppl. 3: 8 (1962) and 5: 4. 1962.

Illustrations: F. E. Lloyd, Carnegie Inst. Wash. Publ. 82: pl. 3. 1908; E. D. Schulz, Texas Wild Fls. 336. 1928; Lewis & Oliver, Am. Journ. Bot. 48: 640. 1961.

Erect or ascending summer annual or perennial herb, various in form, often sprawling, semi-prostrate, or prostrate, spreading, sometimes 60 cm. tall, subcanescent throughout; stems several from a common base, usually decumbent, branched, hirsute-hispidulous; branches villous-hirsute; leaves short-petiolate or subsessile, about 2.5 cm. long, subbipinnatifid or commonly trifid, with the divisions more or less deeply incised, hirsute-strigillose or strigose-hispidulous on both surfaces, the middle divisions pinnatifid or subbipinnatifid, the lateral ones mostly bifid, the ultimate segments linear-oblong, about 2 mm. wide, acutish at the apex, with slightly revolute margins; spikes subsessile or short-pedunculate, dense, elongate during anthesis, more or less compact in fruit, hispid-hirsutulous and glandulose; bractlets a little shorter or one-third shorter than the calyx, lanceolate, acuminate or subulate at the apex, hirsute-ciliate; flowers showy, with a faint fragrance of lilac (Syringa vulgaris L.); calyx 6--8 mm. long, somewhat glandulose, hirsute-hispidulous, its lobes 5, short, unequal, subulate; corolla showy, varying from red, reddish-purple, pink-lavender, pink-purple, purple, magenta, or pink to lilac-purple, violet, violet-purple, lavender, light-lavender, pale-violet, violet-blue, blue-purple, pale-blue, or blue, sometimes merely tinged pink, much longer than the calyx, its tube slender, one-third longer than the calyx, 10--12 mm. long, pubescent on the outer surface, barbate at the mouth, the limb medium-large, 6--8 mm. wide, the lobes obtuse or retuse, the lowest emarginate; dorsal anther-appendages minute; cocci 2.5--3 mm. long, reticulate-scrobiculate above, striate toward the base, the commissural faces muricately scabrous; chromosome number: n = 15.

The type of this species was collected by Carl Theodor Hartweg (no. 176) at Leon, Guanajuato, Mexico, in 1839. Walpers classifies the species in his Sect. Verbenaca Walp., Subsect. Inermes Walp., Group Foliosae Walp., Subgroup Macranthae Walp., and Secondary Subgroup Aubletia (Neck.) Walp., along with ten other species. The type of V. candelabrica was collected by Walter Schumann (no. 1071) at Feral, Mexico.

It is worthy of note here that V. ciliata var. nepetifolia Tidestr. is V. gooddingii var. nepetifolia Tidestr. The V. erinoides of Chodat is V. calliantha Briq., of Lamarck is V. laciniata (L.) Briq., of Hooker, of Hooker & Arnott, of Linnaeus, of Poeppig, and of Sprengel is V. berterii (Meisn.) Schau., and of "Authors" is V. dissecta Willd.

The species inhabits gravel, loose gravelly or moist adobe soil, volcanic and volcanic ash soil, gravelly volcanic and silty-gravelly soil, and moist brownish sandy loam in open scrublands, pinelands, oak- and mesquite-grasslands, xeric scrublands, high mountain meadows, wet meadows, open plains, cropped hillsides, burned-over pinelands, thin-soiled rocky slopes, foothills, valleys, hills, mountains, volcanos, bare hills, dry hills, and mesas. It has been found by collectors in black soil along roadsides, in sandy soil on roadbanks, in waste places, dry gulches, dry land, and dry situations in general, in arid or sparsely wooded grasslands, sinks in flats, deserts, fields and weedy fields, and meadows, on gypsum flats, gentle rocky volcanic slopes, caleche slopes of mountain valleys, plains, gravelly brush-covered and sandy plains, sandy flats, sandy valley land, grassland with scattered pines or with stony outcrops, rocky canyon walls, and limestone hills, on transition pine slopes and open deserts, at the edge of cienaga, on grassy stony flats, gravelly hillsides in deserts, large open meadows and cienagas surrounded by pine forests, and along roadsides. In Texas it is said to grow on flats and plains and along roadsides, growing in patches, but never in extended areas like V. bipinnatifida Nutt.;

Warnock describes it as "infrequent on flats" in Brewster County, while Runyon says it is "common" in Cameron County. Gregory & Eiten found it prostrate in grazed grass of heavily grazed area in the Federal District of Mexico, while Muller found it "sparse on grassy slopes" in Chihuahua and Feddema "occasional in loam soil in open sun or partial shade" in Nayarit. Maysilles calls it a "rather common roadside weed". Gentry states that it is found on warm slopes in pine forests, locally abundant with *Stevia*, *Linum*, and *Geranium* in the Lower Pine Forest district of Chihuahua, while Martinez says that it grows in "suelo arenoso con grava superficial y subsuelo profundo, vegetacion *Bouteloua eriopoda* dominante, pastival de *B. gracilis* deteriorado." Stanford, Retherford, & Northcraft found it on a valley floor sparsely covered with *Yucca* and *Larrea* on the Coahuila-Zacatecas border, and in playa valleys with considerable drainage from the surrounding hills, with *Larrea*, *Acacia*, and herbaceous weeds common, in Coahuila. McVaugh encountered it as occasional on brush-covered hills among shrubs and small trees (*e.g.*, *Acacia*, *Mimosa*, *Opuntia*) in Agua Calientes.

In Nuevo Leon it is said to be abundant on open rocky slopes, while Mueller & Mueller report it "scattered in open woods of broad canyon". King says that it is abundant in sandy loam, in open sun, in Puebla, while in Durango it is a "rather common roadside weed" and grows on "steep canyon walls and shaded cool moist ravines" according to Maysilles.

It has been collected at altitudes of 30 to 11,800 feet, blooming and fruiting from February to November. Runyon reports that in Cameron County, Texas, it "flowers in spring, showy, nearly red to pure purple". In that state it is found from Llano and Burnet Counties, south to Webb and Cameron, east to Polk, and west to Brewster Counties. In Arizona it was found by Bohrer in clay-like soil with grama and annual weeds. Vernacular names reported for it are "alfombrilla", "alfombrillo", "alfornbrilla", "chinatú", "moradilla", "verbena", "vervain", and "wild verbena".

Schauer (1847) compares the species with *V. pogostoma* Klotzsch as follows: "Mire similis V. ciliatae, vero tamen distincte pube, fol. laciniis magis elongatis, corolla et antheris super. omni vestigio appendicis carentibus." McDougall & Sperry (1951) state that *V. ciliata* can be distinguished from *V. bipinnatifida* in that it has "the stems more likely to be partly prostrate, the leaves are only once or twice cleft, and the flowers are somewhat smaller, often less than one-fourth inch across." Perry (1933) notes that "This is a variable and wide-ranging species closely related to the *bipinnatifida-Wrightii-ambrosifolia* complex and scarcely capable of sharp delimitation. Its best characters are the hirsute-hispid pubescence, the usually sessile compact spike, the medium-short somewhat glandular calyx subtended by a slightly shorter bract. The specimens, *Seaton 150*, *Pringle 9313*, and *Gregg 648*, have typical spikes, but the leaves are small and the stems tend to be repent, suggesting a possible intergradation with

V. teucriifolia." A note on Edw. Palmer 36 in the United States National Herbarium states that "The seed has the commissure scabrous, as in specimens of V. Aubletia."

Seeds of V. ciliata are offered to the horticultural trade by D. M. Andrews at Boulder, Colorado. The F. Miranda s.n. [10 Julio 1946] specimen cited below is actually a seed voucher. The physicochemical properties of the plant sap of this species in relation to phytogeography are discussed by Harris (1934), based on a specimen collected in a small arroyo near the Desert Laboratory, along the west wash, Tumamoc Hill, at Tucson, Arizona.

The species is sometimes infected by the fungi Dicaeoma sarcobati Arth. and Puccinia subnitens Diet. according to Seymour (1929). Specimens have been misidentified in herbaria and distributed as Verbena ambrosiaefolia Rydb., V. ambrosifolia Rydb., V. ambrosiifolia Rydb., V. ambrosifolia f. eglandulosa Perry, V. andrieuxii Schau., V. arizonica A. Gray, V. aubletia Jacq., V. bipinnatifida Nutt., V. bipinnatifida (Nutt.) Schau., V. bipinnatifida Schau., V. bipinnatifidus Nutt., V. bracteata Michx., V. ciliata var. longidenta Perry, V. ciliata var. longidentata Perry, V. ciliata var. pubera (Greene) Perry, V. elegans H.B.K., V. elegans var. asperata Perry, V. exilis Schau., V. gooddingii Briq., V. gracilis Desf., V. multifida Ruíz & Pav., V. prostrata R. Br., V. pubera Greene, V. racemosa Eggert, V. teucriifolia Mart. & Gal., V. teucriifolia var. corollulata Perry, V. wrightii A. Gray, and even Collomia heterophylla Hook. in the Polemoniaceae and Datura sp. in the Solanaceae!

On the other hand, the G. L. Fisher 18, Griffiths 4244 and 5515, Peebles & Smith 13972, Warnock & McBryde 14750, Wooton & Standley 3691, and Zuck s.n. [Holbrook, Aug. 16, 1896], s.n. [Taylor, Aug. 1, 1897], and s.n. [Holbrook, Oct. 9, 1897], distributed as V. ciliata, are all V. ambrosifolia Rydb.; Blankinship s.n. [Huntsville, Apr. 16, 1896], Collom 248, Kearney & Peebles 13983, and Edw. Palmer s.n. [Willow Spring, May 1890] are V. bipinnatifida Nutt.; Donnelly 5 is V. bipinnatifida var. latilobata Perry; G. L. Fisher 41 is V. canadensis (L.) Britton; R. Runyon 630, Rose & Rose 11398, Ruth 110 (in part), and E. D. Schulz 845 are V. ciliata var. longidentata Perry; J. Skehan 5 and Toumey s. n. [Chiricahua Mts., Apr. 5, 1897] are V. ciliata var. pubera (Greene) Perry; Hotchkiss 6184, Edw. Palmer 1045, R. Runyon 327, and Wiggins 6288 are V. delticola Small; the L. H. Hooker 5999, distributed as "V. sp. aff. V. ciliata", is also V. delticola Small; Purpus s.n. [1907] is V. elegans H.B.K.; Edw. Palmer 51 and 295, Purpus 4974, M. Taylor 129, and S. S. White 4178 are V. elegans var. asperata Perry; K. Brandegee s.n. [Cima, June 1915], T. S. Brandegee s.n. [Las Durasnillas, May 18, 1892], J. I. Carlson s.n. [South of Warren, June 7, 1915], Crosswhite & Sands 788, Eastwood 18032, Goodding 2231, F. W. Gould 4707, Kearney & Peebles 11100, and Edw. Palmer 339 and 340, as well as N. C. Wilson 99 and Wooton s.n. [Kingman, Mch. 11, 1912], are all V. gooddingii Briq.; T. S. Brandegee s.n. [Vallederos Ck., May 4, 1893] and s.n. [Agua Dulce, May 16, 1889], Crosswhite 515, M. E. Jones 3901, C. R. Orcutt 1303, s.n. [10-6-1882], s.n. [10-5-1882], and s.n. [Rosario, 5/3/1886], Rose, Standley, & Russell 15176, Rothrock s. n. [Tucson], and N. C. Wilson 37 and 95 are all V. gooddingii var. nepetifolia Tidestr.; the Vasey s.n. [Tucson, 1881], distributed as "V. aubletia or ciliata", is also V. gooddingii var. nepetifolia Tidestr.; Lindheimer 1075 and III.501, Ruth 110 (in part), and C. Wright 1500 are V. pumila Rydb.; Edw. Palmer 1045 is V. quadrangulata Heller; Roane 28 is V. racemosa Eggert; I. J. C. s. n. [Nov. 22, 1907] is V. robusta Greene; Pringle 4180 & 13792 and Rose & Hough 4484 are V. teucriifolia Mart. & Gal.; Parry & Palmer 719 and Purpus 137 are V. teucriifolia var. corollulata Perry; and Griffiths 5190 and Nelson & Nelson 5017 are V. wrightii A. Gray.

The Clemens & Clemens 976, previously determined as V. ciliata, is actually V. pumila Rydb. The State College of Washington specimen of Nelson & Nelson 1364 has the corolla about equal to the calyx in length and is here cited under V. gooddingii, but the University of Washington specimen of the same number shows the corolla much longer than the calyx and is here regarded as V. ciliata. The Fox J.7 specimen of V. ciliata was originally mounted on the same sheet with Nelson & Nelson 1429, which is V. gooddingii. Parry & Palmer 719 is a mixture with V. teucriifolia var. corollulata Perry, Warnock T.66 is a mixture with V. wrightii A. Gray, Stanford, Retherford, & Northcraft 498 and Waterfall & Wallis 13806 are mixtures with V. canescens H.B.K., and Burnham 305 is a mixture with Phacelia sp. (Polemoniaceae).

J. I. Carlson s.n. [Douglas, May 13, 1915] was determined by Kearney as being in part V. ambrosifolia and in part V. bipinnatifida, but I think that it is all V. ciliata or V. ambrosifolia f. eglandulosa Perry. Worth & Priest 585 is doubtfully placed here — its flowers are unusually large for this species. The H. S. Barber 106, Griffiths 4757, W. Hough 109, Peebles 5353, Toumey 305 1/2, and Zuck s.n. [Snowflake, July 30, 1897], cited below, were all annotated by Kearney as "V. wrightii?" The Wynd & Mueller 450 specimens cited under V. bipinnatifida Nutt. will probably, on re-examination, prove to be V. ciliata.

It should be noted here that Coulter, Contrib. U. S. Nat. Herb. 2: 327 is cited as "1894" in Lundell, Fl. Texas 3 (1): 43 (1942), but this page seems actually to have been published in 1892.

Adams has appended a note to his South Dakota specimen cited below: "The little spec. I send of Verbena Bipinnatifida is not a fair sample of the pretty plant, wh. in a good season forms round mats bright with bloom, by dusty roadsides: some have a striped petal." His specimen seems to be V. ciliata.

The following notes by Cory are of particular interest — in speaking of his no. 35568, cited below, he says: "This is the white-flowered verbena growing in the Ft. Stockton, Sanderson, and Marathon country, and which has been determined for me before as V. pumila (to which I objected) and as V. racemosa. Of these three I favor V. ciliata. In the FLORA OF TEXAS I note that you do not give this plant as having a white corolla — almost everything but white; whereas our plant almost always has a white corolla. In age there is a suggestion of purplish coloration. This species grows in abundance in highly calcareous soils, is of prostrate growth, and usually makes rather a limited growth. It may have a connection with V. racemosa or with V. ciliata, if it is not V. ciliata itself. This number was of one plant only and was from a draw about two miles west of the Glass Mountains." It is possible that this plant should be given a form name, since it is the only specimen seen by me where the collector states the corolla to be white. Usually the white-flowered specimens from western Texas have proved to be V. racemosa Eggert.

Schauer (1847) cites C. Ehrenberg 1242 and Hartweg 176, both from Mexico, in the Berlin herbarium, now doubtless destroyed. Perry (1933) cites "Kuntze 424" from Zacatecas in the Britton Herbarium, but this is almost certainly a typographic error for Kuntze 23424. She cites the following 66 additional specimens not as yet seen by me: NEW MEXICO: County undetermined: Mearns 108 (G). ARIZONA: Maricopa Co.: M. E. Jones 26231 (E). MEXICO: Chihuahua: Gregg s.n. [April 28/47] (E, G); Edw. Palmer 79 (E, F, G), 281 (G); Pringle 1117 (F). Coahuila: Gregg 26 (E), 57 (E), 257 (E); Edw. Palmer 74 (E, F, G); Purpus 4524, in part (E, F). Durango: Gregg 632 (E); Nelson 4559 (E), 4604 (E); Edw. Palmer 345 (E, F, G), 401 (E, F, G). Federal District: Bourgeau 120 (G); Pringle 9313 (E, G). Guanajuato: Duges 496 (G), 496a (G); Hartweg 176 (G—isotype). Jalisco: Furness s.n. [Guadalajara, Aug. 1909] (F); Edw. Palmer 35 (G, W); Pringle 11091 (E, F). México: G. L. Fisher 319 (E), s.n. [Amecameca, 24 July 1924] (F); Gregg 648 (E); Pringle 13158 (F, G). Michoacán: Gregg 756 (E); Seler 1174 (G). Nayarit: M. E. Jones 23244 (E); Edw. Palmer 2055 (W). Oaxaca: Seler 1379 (G). Puebla: C. C. Deam 86 (G), s.n. [Cholula, Jan. 1, 1879] (F); Purpus 3407 (E, G). Querétaro: Arsène & Agniel 10252 (E, F, G). San Luis Potosí: Parry & Palmer 719, in part (D, E); Schaffner 717 (D, G). Sonora: Thurber 769 (G). Vera Cruz: Seaton 150 (F, G), 391 (F, G, W). State undetermined: Coulter s.n. (D); Schumann 1071 (G). The Rose & Rose

11398 which she cites is var. longidentata Perry. She has appended a note to the U. S. National Herbarium specimen of H. E. Seaton 319: "The number of this collection in Gray Herb. and Columbia College Herb. is 391". This is probably the collection which she cites as "391" from Gray Herbarium, Chicago Museum of Natural History, and the United States National Herbarium. The United States National Herbarium specimen of Pringle 13158 bears a label which was originally inscribed "13155". Her "Arsène & Agniel 10252" is cited hereinafter as Agniel s.n. [Arsène 10252]. She cites Halsted s.n. and Nelson 223 & 242 as V. teucriifolia Mart. & Gal., but I think that they are V. ciliata. Probably the other hirsute collections which she mentions under V. teucriifolia are also V. ciliata, or a hybrid between the two species.

In all, 403 herbarium specimens, including the type material of both names involved, have been examined by me.

Citations: TENNESSEE: Davidson Co.: Michaux s.n. [in urbe Nashville] (C). SOUTH DAKOTA: Hughes Co.: L. Adams s.n. [June 27/94] (Ur). OKLAHOMA: Beaver Co.: G. W. Stevens 346 (Ur). TEXAS: Brewster Co.: Cory 35568 (N, N); Warnock T.66, in part (Au), W.284 (N), W.625 (Au). Brooks Co.: C. L. Lundell 10825 (N, Rf). Burnet Co.: Tharp s.n. [Granite Mt., 4-13-1930] (Au, Mi, N). Cameron Co.: R. Runyon 1010 (Rr), s.n. [Brownsville, 1930] (Hp). Edwards Co.: Cory 38871 (N, N). Hall Co.: R. W. Bennett 44 (Tr—19290). Hansford Co.: Headlee 66 (Ar—99346). Llano Co.: M. E. Jones 29190 (Po—199872). McMullen Co.: F. A. Barkley 16T301 (Au, N, S). Polk Co.: Parks & Cory 5611 (Tr). Ward Co.: T. A. Williams s.n. [Pyote, May 19, 1900] (W—519877). Webb Co.: Hamby 500 (Ar—206657); Herb. Univ. Texas s.n. [Laredo, 2-27-30] (Au). County undetermined: G. A. Black 38-4721 (N); Herb. Univ. Texas s.n. (Au). NEW MEXICO: Bernalillo Co.: J. Lauber 101 [4483] (S). Catron Co.: Shreve 8279 (Ca—882845). Grant Co.: Mulford 896 (Ur); W. Stewart s.n. [Pinos Altos, June 26, 1936] (Bl—42330, La, Mi). Lincoln Co.: Hitchcock, Rethke, & Raadshooven 4264a (Se—44821); Worth & Priest 535 (Ba), 585 (N). Santa Fe Co.: J. R. West 13216 (S). Socorro Co.: Ferris & Duncan 2292 (Gg—31430). Valencia Co.: Nelson & Nelson 2187 (I). County undetermined: Ehlers & Ehlers 6307 [Wilma] (Mi); Mearns 108 [Upper Corner Monument 31°47'] (N). ARIZONA: Cochise Co.: Carlson s.n. [Douglas, May 13, 1915] (Gg—31274); Peebles 5353 (W—1435050); W. W. Price s.n. [Apr. 21, 1894] (Du—97118), s.n. [June 1894] (Du—97117); J. J. Thornber 2671 (Tu), 7121 (Tu); Toumey s.n. [Cave Creek, 6/25/40] (Cm). Coconino Co.: Deavers 3133 (Fg), 3134 (Fg); Ehlers & Ehlers 6690 (Mi); Ensor 47 [111] (Fg); A. Nelson s.n. [Schnebly Hill, 5/23/40] (Fg). Gila Co.: R. E. Beckett 10023 (To, W—1624480); E. H. Graham 3789 (Cm); Shreve 7451 (Mi). Graham Co.: Bohrer 335 (Gg—

377373); Herb. Soil Conserv. Serv. 261 (Tu); Munz 1249 (Po--123800); Peebles 12989 (N). Greenlee Co.: L. D. Benson 9467 (Ca--777728). Maricopa Co.: M. E. Jones 26231 (Du--235288, Gg--237863, I, La, La, Mn--22401, Po--178357, W--1635813); Peebles & Loomis 6732 (I). Mohave Co.: M. E. Jones s.n. [Peach Springs, June 15, 1930] (I); L. S. Rose 40079 (Bt--59604, We). Navajo Co.: W. Hough 109 (W--564915); Zuck s.n. [Snowflake, July 30, 1897] (W--664467). Pima Co.: Burnham 305 (I); J. L. Fox J.7 (N); H. W. Graham 7-9-6 (Cm), 8-5-37, in part (Cm); Nelson & Nelson 1364, in part (Se--16882); K. F. Parker 5913 (Ca--737088). Yavapai Co.: H. S. Barber 106 (W--499203); Demaree 41126 (Gg); Griffiths 4757 (W--496411); W. W. Jones s.n. [Prescott, May 30, 1922] (Ca--407939); Toumey 305 1/2 (Tu, W--212337), s.n. [7-30-1891] (Ca--882633, Tu). County undetermined: S. B. Parish s.n. [July 1882] (Ca--192065). CALIFORNIA: Los Angeles Co.: G. Hall s.n. [Pomona, Feb. 1927] (Hp). MEXICO: Aguas Calientes: McVaugh 16634 (Mi); Rose & Painter 7742 (W--451359). Chihuahua: Correll & Johnston 21457a (Ld), 21525 (Ld), 21731 (Ld); B. M. Dobie 35 (N); H. S. Gentry 2758 (Fs); Gregg s.n. [April 28/47] (T); Herb. Inst. Biol. Univ. Nac. Mex. 2018 (Me); Knobloch 251 (Ok), 1009 (Mi, W--2215050); Martinez M. 17 (Au--181443); Mexia 2537 (Ca--442675, Gg--286730, I, Mi, N); C. H. Muller 3347 (Mi); Edw. Palmer 79 (N, S, W--573554), 281 (N, W--573747); F. W. Pennell 19252 (N, W--1641569); Pennington 28 (Au--180080), 366 (Au--121728); Pringle 1117 (C, Me, Me, Vt, W--154994), 19252 (Me); Shreve 7926 (Fs, Mi, W--1822628); Thurber 317 (N); S. S. White 2042 (Mi, W--1822864), 2043 (S), 2167 (Mi); E. Wilkinson 142 (W--1323049), s.n. [Santa Eulalia plains, Sept. 26, 1885] (Ca--192063, Ob--50863, W--147560, W--221202). Coahuila: Aguirre & Reko 58 (N); Arsène 3384 (N); O. M. Clark 6709 (Ok--18720); Correll & Johnston 21343 (Ld), 21344 (Ld); G. L. Fisher 223 (W--1316037); F. W. Gould 6441 (Mi); Herb. Inst. Biol. Univ. Nac. Mex. 7138, in part (Me); Hernandez Corzo, Rowell, & Barkley 16M488 (Au, N); Kenoyer & Crum 2654 (Mi); Lewis & Oliver 5417 (Nb); E. G. Marsh 1188 (St); E. W. Nelson 3920 (W--266881); Edw. Palmer 74 (Ca--104878, Me, N, W--336067); Purpus 1095 (Ca--138827, N), 4524 (Ca--144793); Rose & Painter 6431 (W--451710); Stanford, Retherford, & Northcraft 241 (N), 498, in part (Du--291315, Se--70451, Tu--11303); Waterfall & Wallis 13276a (St); S. S. White 2018 (Mi, Tu--35532); White & Chatters 206 (Mi); Wynd & Mueller 450 (I, N, W--1639871). Colima: M. E. Jones 686 (Po--243637). Durango: Correll & Johnston 20044 (Rf); G. L. Fisher 44260 (N), s.n. [Tepehuanes, July 28, 1944] (Ew); H. S. Gentry 6870 (Mi); Maysilles 7039 (Mi, N, W--2215262), 7057 (Lm, N), 7684 (W--2215337), 7879 (Mi), 8262 (Mi), 8462 (Mi); E.

W. Nelson 4559 (W—332582), 4604 (W—332620); Edw. Palmer 345 (Ca—104829, N, W—304176), 401 (Ca—139762, N, W—571426); Shreve 8797 (Fs, Mi, W—1749333); Waterfall 15403 (St); Waterfall & Wallis 13409 (St), 13551 (St). Federal District: Bourgeau 120 (Br, Cb, S); Bravo Hollis 7138 (Me); Degener & Degener 26182 (N); Gregory & Eiten 51 (Mi); F. Miranda s.n. [10 Julio 1946] (N); Miranda & Barkley 16M989 (Au, N, N); Moldenke & Moldenke 19846 (N); Pringle 9313 (N, Vt, W—396429); B. P. Reko 4687 (Me); Schiefer 99 (Mv); E. Wall 4 [1/5/28] (Ew), 4 [2/5/28] (Ew); Zamora, Paxson, & Barkley 16M872 (Au). Guanajuato: Barkley, Rowell, & Paxson 722 (Au—123263), 757 (Au—123224, N); Barkley, Webster, & Paxson 722 (N); G. L. Fisher 207 (W—1316025), s.n. [July 28, 1926] (Du—154567); Hartweg 176 (N—isotype); Spivey 169 (Ca—916746); Yates & Wilcox 86 (Ak—31229). Guerrero: Richards & Rowell 3295 (Cb); Wilkinson & Rowell 3394 (Cb). Hidalgo: O. M. Clark 7044 (N); Collector undesignated 106 (Q); L. I. Davis 231 (N); M. Martinez s.n. [Cerca de Pachuca, Nov. 1945] (N); Moldenke & Moldenke 19841 (N); Pringle 7591 (Po—63869); Schiefer 15 (Mv). Jalisco: Bárcena 180 (Me); Furness s.n. [Guadalajara, August 1909] (W—1430142); P. Goldsmith 6 (Ca—924023, W—1842357); Edw. Palmer 35 (Bm, C, Pa, Sg—16098), 36 (W—56164); Pringle 11091 (Cm, Me, Me, N, Vt, W—460473); Safford 1398 (W—573395); Valentin 226 (Me); Weintraub & Roller 121 (Mi), 152 (Mi). México: G. L. Fisher 319 (W—1207408); Fröderström & Hultén 1200 (N, S); Hinton 4362 (N, W—1822223); F. W. Johnson s.n. [Amecameca, Oct. 1, 1906] (N); MacDaniels 509 (Ba), 546 (Ba); Matuda 21323 (N); Paxson & Barkley 16M827 (Au); Pringle 13158 (Gg—421276, Mi, Tu—35533, Vt, W—461755, W—1586475). Michoacán: Eggler 49 (W—2216815); Hinton 11914 (Mi); E. W. Nelson 6858 (W—399208); Schery 100 (Mi). Morelos: Downing 106 (Cb); W. Fosberg 95 (Z); Fröderström & Hultén 554 (S). Nayarit: Feddema 558 (Mi); M. E. Jones 23244 (Ca—400866, En—6123, Gg—172667, N, Po—162779); Edw. Palmer 2053 (W—305637). Nuevo León: Correll & Johnston 19961 (Rf); Frye & Frye 2446 (Rs—27146, Se—65908, Ua—45967, W—1791007); Herb. Mexican Biol. Exped. Univ. Mich. 927 (Fs); Mueller & Mueller 328 (Au); Edw. Palmer 1045 (Pa); Shreve & Tinkham 9747 (Fs); M. Taylor 129 (Au, Au, N, S). Oaxaca: W. H. Camp 2247 (N); C. Conzatti 3402 (Me); Conzatti & Camp 5237 (Mi); Conzatti, Webster, & Barkley 17M403 (Au—123225, N); Cuming s.n. (Cb); Galeotti 736 (W—572873), s.n. (Br); Herb. Inst. Biol. Univ. Nac. Mex. 7138, in part (Me); C. L. Smith 221, in part (W—312571). Puebla: Arsène 486 (Bz—23751), 1671 (W—464300), s.n. [4/8/1907] (Br, Br); Barkley, Paxson, & Webster 2448 (Au), 2493 (N); O. M. Clark 7328

(Ok--18721); C. C. Deam s.n. [Cholula, Jan. 1, 1899] (Mi); Galeotti 736 (Br, Br, N); Kenoyer A.257 (Mi), s.n. [Puebla, 8-9-38] (Fs); R. M. King 2627 (Gg, N); E. W. Nelson 242 (W--257526); Nicolas s.n. [Rancho Posadas, 28/1/1909] (Br, Br); H. Pittier 436 (W--570831); Purpus 3407 (Ca--138831); Rose & Rose 11398 (N); A. J. Sharp 441001 (O), 441311 (N). Querétaro: Agniel s.n. [Arsène 10252] (Bm, Cm, N, W--1001584); Rose, Painter, & Rose 9503 (W--452994). San Luis Potosí: J. Mann 18 (Cb); Parry & Palmer 719, in part (Io, Pa); J. G. Schaffner 717 (Me). Sonora: Rose, Standley, & Russell 13127 (N, W--635945); Thurber 769 (T); S. S. White 569 (Mi), 2836 (Mi, Mi), 3344 (Mi), 3939 (Mi), 4178 (Mi, N, W--2132337). Tamaulipas: Le Sueur 401 (Au, Fs); Rozynski 312 (Fs, Mi, N); H. W. Viereck 542 (W--1687288). Vera Cruz: L. I. Davis 200 (N); Halsted s.n. [Sandhills, Perote] (T, T); Kerber 255 [Herb. Osten 13019] (Br, Cp, Ug, W--1323073, W--1323074); Matuda 1263 (Mh, Mi, N, N); F. von Müller 325 (N), 591 (N), 597 (Br), 1209 (N), 1319 (M); E. W. Nelson 223 (W--257529); H. E. Seaton 150 (W--56165), 319 (W--56167), 391 (C). Zacatecas: Kuntze 23424 (N, N, N, N); F. E. Lloyd 159 (W--574126); Purpus 137 (Ca--138830); J. N. Rose 2435 (W--301346), 2769 (W--301701); Waterfall & Wallis 13806, in part (Ok). State undetermined: Arsène & al. s.n. [San Baltasar, 22 Mai 1911] (B); Galeotti 782 [Moran] (Br); Gregg s.n. [Valley of Bolron de Mapimi, April 15/47] (T); W. W. Jones s.n. [Aqua Prieta, 4/17/44] (Or--52009); Lemmon & Lemmon 229 [Lake Chapala] (Ca--74006); Liebmann 11311 [Chapulco] (W--1315090); Née 107 (Q); Sallé s.n. [Mexico] (Bm); W. Schumann 1071 [Feral] (W--1323065, W--1323075). SAN PEDROS NOLASCO ISLAND: Galeotti s.n. [S. Pedro Nolasco] (Br). GUATEMALA: Quezaltenango: A. J. Sharp 45208 (N). LOCALITY OF COLLECTION UNDETERMINED: Herb. Mus. Bot. Stockholm s.n. [17/8] (S).

VERBENA CILIATA var. LONGIDENTATA Perry, Ann. Mo. Bot. Gard. 20: 331--332. 1933.

Synonymy: Verbena ciliata var. longidenta Perry ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 312, 331--332, & 355. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Suppl. List Invalid Names 8. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13, 14, & 101. 1942; Moldenke, Alph. List Invalid Names 46. 1942; A. M. T. Davis, Study Boscaje Palma 42 & 61, pl. 10. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 18, 40, & 44. 1942; Moldenke, Phytologia 2: 127. 1945; Moldenke, Alph. List Cit. 1: 13, 17, 38, 42, 91, 111, 255, & 269 (1946) and 2: 393, 451, 493, 522, & 525. 1948; Moldenke, Phytologia 2: 161--162. 1948; Moldenke, Wrightia 1: 231 & 234. 1948; Moldenke, Known

Geogr. Distrib. Verbenac., [ed. 2], 23, 25, 32, & 197. 1949; Moldenke, Alph. List Cit. 3: 677, 678, 680--682, 684, 717, 754, 764, 881--883, & 939 (1949) and 4: 991, 992, 1004, 1022, 1107, 1129, 1138, 1148, 1163, 1171, 1184, 1213, 1220, & 1239. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 12. 1949; Moldenke, Am. Midl. Nat. 59: 357. 1958; Moldenke, Résumé 29, 31, 39, 362, & 471. 1959; Moldenke, Résumé Suppl. 3: 7, 8, & 10 (1962) and 5: 4. 1962.

Illustrations: A. M. T. Davis, Study Boscaje Palma pl. 10. 1942.

This variety differs from the typical form of the species in being of variable size and more or less open habit, its leaves bipinnatifid, and the calyx-teeth 2--2.5 mm. long.

Collectors describe it as an erect or ascending, decumbent, or even prostrate annual or perennial herb, 10 cm. tall, spreading out to mat on the ground, the mats to 1 m. in diameter; roots fibrous; bark green; leaves petiolate or subsessile, incised, dissected, or deeply dissected into many lobes; flowers terminal, varying from odorless to more or less fragrant with the odor of lilac (Syringa vulgaris L.); corolla varying from pink, pinkish-lavender, pink-purple, or lavender to pale-lavender, purplish, blue-purple, lilac-purple, violet-purple, reddish-purple, or purple.

The type of the variety was collected by Jean Louis Berlandier (no. 3020) at Matamoros, Tamaulipas, Mexico, in April, 1836, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis. Perry (1933) says of the variety "Scarcely differing from the species except in the relatively very long calyx-teeth and the often somewhat less deeply cleft leaves."

Runyon makes the remarkable statement that the flowers are "paniculate", but this is certainly erroneous. He describes the plant as an "erect or ascending herb, various in form, common; fls. showy, nearly red to pure purple."

The variety is said to grow in hardpan and clay hardpan, in clay, sandy clay, dry sandy clay, clay-loam, sandy loam, silty loam on levees, sandy loam with gravel, and rich abandoned cultivated soil, inhabiting moist streamsides and roadsides, chaparral, canyons and limestone hills, open ground and fields, clay dunes, flats and vacant lots, prairies, wet meadows, roadside ditches, open pine woods and open oak-pine woods, sandy or mesquite pastures, and low ridges, from sea-level to 20 meters altitude. Runyon reports that it is "abundant bordering the Rio Grande" in Hidalgo County, Texas, and, in Cameron County, "abundant in the vicinity of Brownsville; it covers large areas of ground", "frequent on arroyo banks", and "very abundant; it grows in mass; flowers are showy and bloom two months". Jermy says that it is "abundant on prairies" in Travis County. It has been collected in anthesis and fruit from February to August, November, and December, but is said to bloom in Texas from February to November. In that state it is confined to the central and southern sections, from Llano and Bexar Counties south to Webb and Cameron, east to

Wharton and Denton, and north to Childress and Lubbock Counties. It is said to grow also in Chaves County, New Mexico. Common names recorded for it are "moradia" and "smallflowered verbena" - the latter being a name more frequently applied to *V. bipinnatifida* Nutt.

Specimens have been misidentified and distributed in herbaria under the names of *V. ambrosifolia* Rydb., *V. ambrosiaefolia* Rydb., *V. ambrosifolia* var. *eglandulosa* Perry, *V. bipinnatifida* Nutt., *V. bipinnatifida* var. *latilobata* Perry, *V. bracteata* Lag., *V. canadensis* (L.) Britton, *V. ciliata* Benth., *V. drummondii* Baxt., *V. gooddingii* Briq., *V. pubera* Greene, *V. pumila* Rydb., *V. teucriifolia* Mart. & Gal., and *V. wrightii* A. Gray.

On the other hand, the *McCart & Cantu 71* distributed as *V. ciliata* var. *longidentata* is actually var. *pubera* (Greene) Perry.

Villegas refers to the plant as "frequent" and "abundant" in San Patricio County, Texas, where Tharp & Brown found it inhabiting the Beaumont clay. Johnston found it among plowed brush in blackland clay, in somewhat brushed remnants of prairies on black clay soil along railroad rights-of-way, and in roadside clearings in woods on brownish-gray clayey sand in uplands near a creek. Traverse encountered it on dry hillsides, wind-planed open scrub, in hard-packed gray-brown silt with much cracking of the soil surface, in *Zizyphus-Opuntia lindheimeri* complex, while Gray found it in open full sun with *Phlox*, coneflowers, and prickly-poppies. Waterfall says that it grows at "base of cliffs in yellow pine forests", and Davis & Johnston found it in clearings in dense brush on Fien tight clay along an arroyo. Johnston refers to his plants as "*V. bipinnatifida* very close to *V. ciliata*." The leaves on *White 3344* and *Waterfall 12971* do not look typical.

The San Luis Potosí, Mexico, record given by me in my Known Geogr. Distrib. Verbenac., [ed. 1], 18 (1942) and [ed. 2], 32 (1949) and Résumé 39 (1959) was based on *C. L. Lundell 5590*, which, however, proves to be *V. gooddingii* Briq. On the other hand, the *Lundell & Lundell 10363* from Travis County, Texas, cited in Lundell, Fl. Texas 3 (1): 40 (1942) as *V. bipinnatifida*, is actually *V. ciliata* var. *longidentata*. *Hanson 322* is a mixture with *V. pumila* Rydb., *Heller 1385* is a mixture with *V. quadrangulata* Heller, and *Rose & Russell 24387* is a mixture with *Phyla strigulosa* (Mart. & Gal.) Moldenke. *M. S. Young 113* may be *V. bipinnatifida*, but its leaf-characters are those of *V. ciliata* var. *longidentata*.

The Davis reference given in the bibliography above is actually a thesis entitled "A study of Boscaje de la Palma in Cameron County, Texas, and of *Sabal texana*", by Anna May Tarrence Davis, deposited in public libraries in August, 1942.

Perry (1933) cites the following 11 additional specimens not as yet seen by me: TEXAS: Bexar Co.: *Eggert s.n.* [near San Antonio, 4 April 1901] (E). Hamilton Co.: Trelease s.n. [Vista, May 1892] (E). Kleberg Co.: High 59 (E). Nueces Co.: Orcutt 5792 (E). Webb Co.: Orcutt 5657 (E). NEW MEXICO: Chaves Co.: Benke 5046 (E, F, G). MEXICO: Tamaulipas: Berlandier 1520 (G), 3020 (E--type, G--isotype). She cites Rose & Rose 11398 (G) as V. ciliata Benth.

In all, 168 herbarium specimens, including type material of all the names involved, have been examined by me.

Citations: TEXAS: Bee Co.: Lundell & Lundell 10052 (Ld, W--1888887), 10062 (N). Bexar Co.: Barkley & Parsons 8 (Au); Herb. Wall 5, in part (S); S. McClatchie 175 (W--2131734), 176 (W--2131735); Metz 2505 (Go, S). Cameron Co.: V. Bailey 221 (W--443411); Brenckle 47-349 (N); H. B. Cannon s.n. [La Feria, Feb. 25, 1926] (Mi); Cory 51350 (Sm); L. I. Davis s.n. [Palm Grove, Summer '41] (Au); Davis & Johnston 53253.20 (Au--122027); Hanson 322, in part (Mi); M. C. Johnston 253-10 (Au--122028), 542175 (Au--122022, St); C. L. Lundell 10656 (N, Rf, W--1926928); Lundell & Lundell 8683 (Ld, Mi, N), 9996 (Ld, N, W--1888866), 10024 (Ld, N), 10027 (Ld, N, W--1888879); Muenscher & Muenscher 14457 (N); Nealley 116 (W--62141); Rose & Russell 24387, in part (W--1369656); R. Runyon 630 (W--1224223), 2361 (N, N, N), 2498 [216a] (N, N), 2498 [216b] (N, N), 2498 [216c] (N, N), 2694 (N, N, N, N); Sixth Grade Brownsville s.n. [Nov. 1934] (Au, Au); Tharp, Gimbrede, & Johnston 52-512 (Au--122571); Traverse 1117 (Au--179211, W--2339927); Wolcott & Barkley 16T377 (Au, N). Childress Co.: Biology Class Univ. Texas s.n. [Childress, Apr. 1930] (Au); Wild Flower Contest s.n. [April 1936] (Au). Denton Co.: McCart 998 (Mi). Duval Co.: McCart 7187 (Ok, Ok). Fayette Co.: Warner s.n. [Lagrange, May] (Hu). Garza Co.: Wooton s.n. [Post, May 22, 1925] (W--1244641). Hidalgo Co.: C. C. Albers 46401 (N); L. H. Bailey 7434 (Ba); Clover 567 (Mi, Mi, N); Herb. Univ. Texas s.n. [Edinburg, Spring] (Au); Lundell & Lundell 9801 (Ld, N), 9805 (Ld, N); R. Runyon 2562 (N, N, N). Jim Wells Co.: M. C. Johnston 542122 (Au--122023). Kleberg Co.: M. C. Johnston 53253.24 (Au--122026), 53253.25 (Au--122025), 53253.26 (Au--121654). Live Oak Co.: C. E. Gray 18 (Mi). Llano Co.: Lundell & Lundell 14564 (Sm); Tharp s.n. [Enchanted Rock, 6.12.30] (Au). Lubbock Co.: Demaree 7685 (Du--205651, W--1468996). Medina Co.: J. B. Davy 21 (Ca--25133). Nueces Co.: V. Bailey 258 (W--443446); A. A. Heller 1385, in part (C, Ca--25132, Es, Io--38748, Mi, N, N, Pl--72008, S, Se--14958, Ur, W--213881); M. C. Johnston 542303 (Au--122013); R. Runyon 4279 (N, Sm), 4280 (N), 4281 (Mg, N, Ot, Sm); Tharp 5602 (W--1468814), s.n. [Corpus Christi, 11-9-32] (Au, Au, Au, St--9244); Tharp & Brown 48-169 (Au--121593, N, St, St). San Patricio Co.: L. H. Bailey 7402 (Ba);

Cory 51256 (Sm); Lundell & Lundell 10087 (Ld, N); E. D. Schulz 845 (W--1243240); Tharp & Brown 48-207 (Au--122573, N), 48-222 (Au--121592, Au--121657, N); Williges 2 (Au--175536), 309 (Au--179792). Starr Co.: Lundell & Lundell 9786 (Ld, N, W--1888826). Tarrant Co.: Ruth 110, in part (W--501770). Travis Co.: Armer s. n. [Austin, 4-2-29] (Mi); Lundell & Lundell 10363 (Ld, N); Tharp & Barkley 51-863 (Au--121663); M. S. Young 113, in part (Au--121602, Ca--882578). Webb Co.: Blair & al. 48-492 (Au--122570); Cantu, Villa, & McCart 75 (Ok); Hamby 514 (Ar--206562); Lundell & Lundell 10105 (Ld, N); McCart 7255 (Ok); Reyna, Mendoza, & McCart 6 (Ok). Wharton Co.: J. K. Small s.n. [near Wharton, April 12, 1925] (W--1739112); Small & Wherry 11834 (N). Willacy Co.: Tharp & Ecology Class s.n. [Lyford, March 1, 1930] (Au), Zapata Co.: Lundell & Lundell 10108 (Ld, N). County undetermined: Berlandier 429 (T). NEW MEXICO: Otero Co.: Waterfall 12971 (Mi). MEXICO: Coahuila: Wynd & Mueller 450 (Fs, N), 572 (N). Durango: Forrer s.n. [Sierra Madre, Sept. & Oct. 1881] (Ca--192062); Waterfall 15503 (St); Waterfall & Wallis 13737 (St). Puebla: Rose & Rose 11398 (W--454181). San Luis Potosí: C. L. Lundell 5590 (Mi, N, N, S, Tu--98762). Sonora: S. S. White 3344 (Mi). Tamaulipas: Berlandier 3020 (C--isotype); Tracy s.n. [Matamoros, 4-10-1905] (Tr).

VERBENA CILIATA var. PUBERA (Greene) Perry, Ann. Mo. Bot. Gard. 20: 332. 1933.

Synonymy: Verbena pubera Greene, Pittonia 5: 136. 1903. Glandularia pubera (Greene) Small ex Moldenke, Suppl. List Invalid Names 2, in syn. 1941. Verbena pubera (Greene) Perry ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena ciliata var. pubera Perry ex G. L. Fisher, Am. Bot. Exchange List. 1946. Verbena ciliata pubera Perry ex Moldenke, Résumé 362, in syn. 1959. Verbena ciliata pubera (Greene) Perry, in herb.

Bibliography: Greene, Pittonia 5: 136. 1903; Prain, Ind. Kew. Suppl. 3: 187. 1908; Perry, Ann. Mo. Bot. Gard. 20: 312, 332, & 355. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Prelim. Alph. List Invalid Names 48. 1940; Moldenke, Suppl. List Invalid Names 2 & 10. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 18 & 44. 1942; Moldenke, Alph. List Invalid Names 25 & 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13, 14, & 101. 1942; Moldenke, Castanea 10: 39 & 40. 1945; Moldenke, Phytologia 2: 127--128. 1945; G. L. Fisher, Am. Bot. Exchange List. 1946; Moldenke, Alph. List Cit. 1: 114, 127, 140, 157, 175, 246, 255, 257, 295, & 297. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Moldenke, Phytologia 2: 329 (1947) and 2: 478. 1948; Moldenke, Wrightia 1: 234. 1948; Moldenke, Castanea 13: 112. 1948; Moldenke, Alph. List Cit. 2: 439, 455, 467, 470, 472, 474, 475, 489, 491, 496, 505, 521--523, 571, 588, 595--597, & 639 (1948), 3: 667, 769, 770, 797, 803, 806, 887, 933, 939, 944, & 977 (1949), and 4: 1004, 1097, 1125, 1126, 1138, 1167, 1175, 1198, 1220, 1223, 1239, 1241, 1246, & 1252. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 12. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 20, 23, 25--27, & 197. 1949; Moldenke, Phytologia 3: 304. 1950; Moldenke, Résumé 25, 29, 31, 33, 296, 362, 373, & 471. 1959; Moldenke, Résume Suppl. 5: 4. 1962.

This variety differs from the typical form of the species in its more or less prostrate compact habit and the ultimate segments of the leaves being linear-oblong, their margins strongly revolute.

Collectors describe the plant as upright or erect from a somewhat decumbent or procumbent base. Perry (1933) says "This variety is a low plant with several stems from a common base, short internodes, and a tendency to branch freely. The leaves are more finely dissected than in the species and the margins are more revolute."

The type of the variety was collected by Samuel Mills Tracy and Franklin Sumner Earle (*no. 162*, in part) in the Davis Mountains, Jeff Davis County, Texas, on April 23, 1902. In the United States National Herbarium someone has placed a note on the specimen of this collection reading "*not* type collection", but on what basis is not clear to me.

Collectors have found the plant in red soil, on shady cliffs, mesas, and hills, open grassy plains, level grasslands, on sandy-clay flats, along roadsides, in desert regions and orchards, and along dry arroyos on sand bars, from 4000 to 7100 feet altitude, flowering from February to August and fruiting from March to August. In Texas it is said to be found on plains and low mountains, blooming from February to August, in the Trans-Pecos and Plains Country of the western part of the state, from El Paso to Pecos Counties, north to Garza and Lubbock Counties. The only recorded common name is "bracted verbena", and that was probably applied in error.

Herbarium specimens of this plant have been misidentified and distributed under the names *V. ambrosifolia* Rydb., *V. ambrosiifolia* Rydb., *V. aubletia* Jacq., *V. bipinnatifida* Nutt., *V. bracteosa* Michx., *V. canadensis* (L.) Britton, *V. ciliata* Benth., *V. ciliata* var. *longidentata* Perry, and *V. wrightii* A. Gray.

On the other hand, the *Ripley & Barneby 4188*, distributed as *V. ciliata* var. *pubera*, is actually *V. racemosa* Eggert; *Sperry T.126* is *V. ambrosifolia* Rydb.; *Wooton 2835* and *s.n.* [Ojo Caliente, July 18, 1904] are *V. ambrosifolia* f. *eglandulosa* Perry; *R. E. Beckett 10023* is *V. ciliata* Benth.; *Demaree 7685* is *V. ciliata* var. *longidentata* Perry; and *S. E. Wolff 1666* is *V. wrightii* A. Gray.

Demaree reports that the variety is "common here [Lubbock County, Texas] but considered rare". Nelson & Nelson found it "sprawling on sandy plains" in New Mexico, while Maguire, Richards, & Moeller say that it is "common in grass type with Hilaria mutica, Prosopis, and Yucca elata" in the same state. In Arizona Hanson says that it is "infrequent in cindery soil" and "rare in washes", while Wiegand, Richards, & Moeller describe it as "frequent in grass plains" and in "browse type with Rhus trilobata dominant." Peebles & Fulton 11790 is very typical.

As to C. B. Wolf 2490, my friend, T. H. Kearney, says "V. ambrosifolia Rydb. in the long calyx teeth but otherwise resembles V. ciliata Benth." As to Peebles & Harrison 4112 he says "gland much smaller than anther cells; nutlets very like those of [Loomis & Peebles] 5353, minutely scabrous on the commissure." A typewritten label on Gunning & Goodding 2297 in the University of Arizona herbarium says "Near Fort Stanton, Utah" and Leslie N. Goodding's surname is misspelled "Gooding". The Collector undesignated s.n. [Partridge Creek, April 26] collection is a mixture with V. gooddingii Briq.

Perry (1933) cites the following 11 additional specimens not as yet seen by me: TEXAS: El Paso Co.: Orcutt 6172 (E). Jeff Davis Co.: Tracy & Earle 162, in part (E--isotype). NEW MEXICO: Grant Co.: Greene s.n. [near Silver City, May 1880] (E). Hidalgo Co.: Evans s.n. [Lordsburg, 3 July 1891] (E); M. E. Jones 26227 (E). Luna Co.: M. E. Jones 26232 (E). ARIZONA: Coconino Co.: H. C. Hanson A.146 (E, F). Mohave Co.: M. E. Jones 25480 (E). Navajo Co.: Zuck s.n. [Taylor, Aug. 1, 1897] (E). Yavapai Co.: W. W. Jones 180 (G).

In all, 109 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: COLORADO: Archuleta Co.: Bethel s.n. [Pagosa Junction, 8-26-1921] (Fc). Denver Co.: Bethel s.n. [Denver, June 1893] (Fc). Huerfano Co.: R. B. Livingston 59 (H--58348). Las Animas Co.: Collector undesignated 4184 (Fc). Pueblo Co.: Harrington & Smith 186 (Fc); Rydberg & Vreeland 5676 (Fc). TEXAS: Brewster Co.: Cutler 21140 (Tr). Culberson Co.: Hinckley 1440 (N). Garza Co.: F. W. Pennell 10532 (N). Jeff Davis Co.: Earle & Tracy 337 (N); Small & Wherry 12072 (N); Tracy & Earle 162, in part (Cm--isotype, Es--isotype, N--isotype, N--photo of isotype, Tr--16180--isotype, Vt--isotype, W--441832--isotype, Z--photo of isotype). LaSalle Co.: A. Cantu 71 (Ok). Lubbock Co.: Demaree 7460 (Du--205838, W--1699021), 7460a (Sd--24074). Pecos Co.: Hinckley 4675 (W--2003758); Parks & Cory 18349 (Tr), 18350 (Tr), 18353 (Tr), 18354 (Tr). Webb Co.: McCart 7194 (Ok, Ok, Ok). NEW MEXICO: Bernalillo Co.: M. E. Jones s.n. [Albuquerque, Sept. 5, 1884] (Gg--130527); E. J. Palmer 31153 (Mg--62). Catron Co.: Wooton s.n. [near Horse Camp, June 18, 1892] (W--736931). Dona

Ana Co.: G. L. Fisher 38148 (Ew). Eddy Co.: Cory s.n. [Carlsbad, 4-24-1926] (Tr). Grant Co.: Eastwood 8465a (Gg--31294), 8527 (Gg-31295); E. L. Greene s.n. [Silver City, May 18, 1880] (Mi), s.n. [near Silver City, May 1880] (Po--71158); Maguire, Richards, & Moeller 11503 (Ua--47406); S. E. Wolff 1704 (W--1623959). Hidalgo Co.: M. E. Jones 26227 (Po--178354). Lincoln Co.: Gunning & Goodding 2297 (Tu--104393); J. Skehan 5 (Ca--25142, Ca--882634, Cm, N, N, Po--63900). Luna Co.: M. E. Jones 3801 (Br, Ca--373380, Gg-154422, N, Ob--50877, Po--71136, Ua--11389, W--220167), 26232 (La, Po--178356), s.n. [Deming, April 29, 1884] (Po--65181). Quay Co.: G. L. Fisher 101 (W--619297). Sierra Co.: Vreeland 804 (N, Pl--22602). Socorro Co.: Wooton 3849 (W--560636). Valencia Co.: Nelson & Nelson 2187 (Ua--23756). County undetermined: D. R. Goddard 728 [Mogollon Mts.] (Ca--505469); L. Johnson s.n. [9-7-1921] (Fc); Wooton s.n. [Mesa near N. H. Ranch, July 13, 1906] (W--736869). ARIZONA: Apache Co.: Peebles & Smith 13972 (To). Cochise Co.: Cottam 10183 (Fs); Gould & Pultz 3154 (Ca--705185, W--1893187); Loomis & Peebles 5353 (To); Toumey s.n. [Chiricahua Mts., Apr. 5, 1897] (W--619183); Wiegand, Maguire, Richards, & Moeller 11150 (Ua--47407); C. B. Wolf 2490 (Gg--174176). Coconino Co.: Bacigalupi 514 (Ca--882631, Du--286365); Cantelow s.n. [Wupatki Natl. Mon., May 4, 1942] (Gg--316094); C. Dudley 59 (Gg--192473); H. C. Hanson 146 (N), A.146 (Au, Or--20488, Ur), A.146a (Bl--42303, Up--80695); Hawver s.n. [July 23, 1932] (Gg--196002); J. T. Howell 26611 (Gg--359562); M. E. Jones s.n. [Cameron's June 16, 1929] (Po--160339); Kearney & Peebles 13983 (To); Peebles & Fulton 11790 (To); Mrs. F. M. Stone 364 (N); L. F. Ward s.n. [near Black Tank, June 1, 1901] (W--410321). Gila Co.: Wiegand, Maguire, Richards, & Moeller 11324 (Ua--47405). Graham Co.: Shreve 5280 (Fs). Mohave Co.: M. E. Jones 25480 (Du--232024, Gg--237847, Mn--22536, Po--179027). Navajo Co.: Hoyt s.n. [Ft. Apache, April 1893] (C); Zuck s.n. [Taylor, Aug. 1, 1897] (N). Santa Cruz Co.: Peebles & Fulton 11489 (W--1634346). Yavapai Co.: Newlon 774 (Ca); Peebles & Harrison 4112 (To); Wiegand & Upton 4187 (N). County undetermined: MacDougal s.n. [1891] (N); L. F. Ward s.n. [near Black Tank, June 1, 1901] (N). CALIFORNIA: Los Angeles Co.: Leal s.n. [Los Angeles, 1882] (H--106469). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. [Partridge Creek, April 26] (W--71929); Purpus 8036 [desert region, southwestern California to southern Utah] (Ca--104880).

VERBENA CLAVATA Ruiz & Pav., Fl. Peruv. & Chil. 1: 21--22, pl. 33b, fig. 1--6. 1798.

Synonymy: *Verbena tetrandra, foliis senis quinisve biformibus; floribus capitato-umbellatis, antheris superioribus dorso clavatis* Ruíz & Pav. ex Poir. in Lam., Encycl. Méth. Bot. 8: 550, in syn. 1808. *Verbena calcicola* Walp., Nov. Act. Acad. Caes. Leopold.-Carol. Nat. Cur. 19, Suppl. 1: 378. 1843. *Shuttleworthia ruiziana* Walp., Repert. Syst. Bot. 4: 12. 1845. *Verbena fissa* Hayek in Engl., Bot. Jahrb. 42: 165. 1908.

Bibliography: Ruíz & Pav., Fl. Peruv. & Chil. 1: 21--22, pl. 33b, fig. 1--6. 1798; Poir. in Lam., Encycl. Méth. Bot. 8: 550. 1808; J. Sm. in Rees, Cycl. 36: no. 8. 1817; Spreng. in L., Syst. Veg., ed. 16, 2: 749. 1825; Walp., Nov. Act. Acad. Caes. Leopold.-Carol. Nat. Cur. 19, Suppl. 1: 378. 1843; Walp., Repert. Syst. Bot. 4: 12 & 15--16. 1845; Schau. in A. DC., Prodr. 11: 550--551. 1847; Jacks., Ind. Kew. 2: 895 & 1178. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 104. 1907; Hayek in Engl., Bot. Jahrb. 42: 165. 1908; Prain, Ind. Kew. Suppl. 4: 245. 1913; Stapf, Ind. Lond. 6: 429. 1931; R. Espinosa, Ökol. Stud. Kordillerenpfl. 36 & 38. 1932; Moldenke, Suppl. List Invalid Names 7 & 8. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35 & 101. 1942; Moldenke, Alph. List Invalid Names 40, 46, & 47. 1942; Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 244. 1943; Moldenke, Bot. Gaz. 106: 162. 1945; Moldenke, Holmbergia 4: 151. 1945; Moldenke, Phytologia 2: 335 & 338. 1947; Moldenke, Castanea 13: 116. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 2: 593 (1948), 3: 687, 728, 732, 766, 881, & 893 (1949), and 4: 1078, 1112, 1113, 1134, & 1215. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 101, & 197. 1949; Moldenke, Phytologia 3: 290. 1950; Biol. Abstr. 26: 3844. 1952; Moldenke, Résumé 84, 121, 344, 360, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 41. 1962.

Illustrations: Ruíz & Pav., Fl. Peruv. & Chil. 1: pl. 33b, fig. 1--6. 1798.

Perennial herb or small subshrub, sometimes a dwarfish shrub or bush, 15 cm. to 1 m. tall, usually prostrate or decumbent, bushy-branched, strigose-hirtous and incanous or canescent throughout, woody at the base; stems ascending or often decumbent, much branched; leaves decussate-opposite, 6--15 mm. long, spreading, sessile, resembling those of rosemary (*Rosmarinus officinalis* L.), gray-green, tripartite almost to the base, the lobes lanceolate, divaricate, linear, obtuse, and entire or cuneate and 2- or 3-fid, revolute along the margins, often forming a sub-verticil around the stem, powerfully fragrant; spikes sessile, capitate, few- or many-flowered, involucrate by the uppermost leaves; bractlets lanceolate or linear-oblong, subequaling or shorter than the calyx, canescent-hirsute; flowers powerfully fragrant; calyx prismatic-pentagonous, long-tubular, about 6 mm. long, red, canescent-hirsute, its rim acutely 5-dentate or unequally 5-fid, the lobes plicate-subulate; corolla hypocrateriform, varying from purple or purplish to violet, parma-violet, lilac, clear-lilac, pale-pink, pale bluish-pink, or even blue, its tube usually purple, 2--3 times as long as the calyx, strigose-pubescent above, pubescent in the throat, the limb usually light-purple, medium in size, the lobes linear-oblong, 2 narrow and entire, the rest emarginate; anther-appendages exserted, clavate, stipitate, curvate-divergent; fruiting-calyx constricted and contorted above the fruit.

Cotypes of this distinctive species were collected by Hipólito Ruíz at or near Arica and Huánuco, Peru, and are deposited in the herbarium of the Botanisches Museum at Berlin, now probably destroyed. *Shuttleworthia ruiziana* is based on the Arica collection, and is merely a new name for *Verbena clavata*. The type of *V. calcicola* was collected by Franz Julius Ferdinand Meyen at Pampa Grande, Arequipa, Peru, and was also deposited in the Berlin herbarium. It is most lamentable that these historic specimens should have been destroyed during World War II. *Verbena fissa* was based on August Weberbauer's *no. 2768*, collected in open formations of herbs, cacti, bromeliads, and shrubs, at lower Ocros, in the province of Cajatambo, Ancash, Peru -- the label on Macbride's photograph of this collection is incorrectly inscribed "768" -- and on *no. 389*, collected in sandy soil on the hills east of Mollendo, Arequipa, Peru, at 500 meters altitude, but descending to 200 meters and said to be very abundant.

The species was placed by Schauer in his Section *Glandularia*, while Walpers placed it in his Section *Verbenaca*, Subsection *Inermes*, and Group *Thymoides*. Schauer notes that "Foliis ab affinibus distinctissima".

The species has been collected in dry, stony, sandy, or clayey soil, in partial shade or full-sun exposure, among rocks, on desert hills or dry hillsides, in dry sandy gullies, in arenales or the lower part of loma zone, on middle and lower green slopes, and in almost desert or true desert country, at altitudes of 15 to 3300 meters, flowering from January to March and August to November. Hitchcock states that it blooms "after the October rains". Common names recorded for it are "verveine à massue" and "whorled vervain".

Specimens of this plant have been misidentified and distributed in herbaria as *Hierobotana inflata* (H.B.K.) Briq., which it resembles superficially. *R. S. Williams 2969* was misidentified and distributed in herbaria as *Frankenia lignosa* Rusby, of which the type is *R. S. Williams 2531* (cfr. Bull. N. Y. Bot. Gard. 8: 106. 1912). On the other hand, the *Weberbauer 7385*, distributed as *V. clavata*, is actually var. *casmensis* Moldenke.

Raimondi (1943) cites his *no. 686* from Ancash, Peru, and *no. 13001*, also from somewhere in Peru. He says "Flores blancas o ligeramente moradas, muy aromáticas. Planta rastrera". Johnston says "flowers white or pink", and Ferreyra has indicated the flowers as "white-violet" or "white-rose", probably meaning that the corolla varies from violet or rose to white. The white form is described below.

In all, 30 herbarium specimens and 6 photographs, including phototypes of all the names involved, have been examined by me.

Citations: PERU: Ancash: Proaño 66 (Ok); Sandeman 4611 (K, W--2210962); Weberbauer 2768 [Macbride photos 17416] (Kr--photo, N--photo). Arequipa: Cook & Gilbert 41 (W--603336); Eyerdam 25159 (Ca--658266); R. Ferreyra 5554 (N), 6345 (W--1998691), 6378 (W--1998696), 11575 (Ok), 11577 (Ok), 12079 (Ok); A. S. Hitchcock 22419 (W--1196666); I. M. Johnston 3560 (S); Meyen s.n. [Pampa Grande; Macbride photos 17409] (Kr--photo, N--photo); Rauh & Hirsch P.564 (Z); Sandeman 4018 (K); Scolnik 1030 (Er, N); Vargas 2023 (W--1830538); J. West 8202 (Ca--565207); R. S. Williams 2914 (N), 2969 (N). Huánuco: Ruíz s.n. [Macbride photos 17408] (Kr--photo of cotype, N--photo of cotype). Lima: S. G. E. Saunders 211 (Bm). Moquegua: Weberbauer 7464 (S, W--1474548). Tacna: R. D. Metcalf 30374 (W--1834984). Department undetermined: Cuming 954 (Br, N); Née 95 (N, Q). CHILE: Antofagasta: Barros Valenzuela 8008 (N).

VERBENA CLAVATA f. ALBIFLORA Moldenke, Phytologia 3: 278--279. 1950.

Bibliography: Moldenke, Phytologia 3: 278--279 & 286. 1950; Biol. Abstr. 26: 3844. 1952; Moldenke, Résumé 84 & 471. 1959.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by my good friend, Ramón Ferreyra (no. 2507) in a sandy habitat between 300 and 350 meters altitude between Naxca and Chala, Arequipa, Peru, on November 7, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has also been collected in deserts, at an altitude of 200 meters, flowering in March.

In all, 4 herbarium specimens, including the type, have been examined by me.

Citations: PERU: Arequipa: Alva A. 158 (W--2270249), 181 (W--2270250); R. Ferreyra 2507 (N--type). Ica: Rauh & Hirsch P.475 (Z).

VERBENA CLAVATA var. CASMENSIS Moldenke, Phytologia 4: 58. 1952.

Bibliography: Moldenke, Phytologia 4: 58 & 70. 1952; Moldenke, Résumé 84 & 471. 1959.

This variety differs from the typical form of the species in having its leaves mostly nigrescent in drying, about 3 mm. wide, with short irregularly spreading and twisted hairs on both surfaces, and only very slightly revolute along the margins.

The type of the variety was collected by Ramón Ferreyra (no. 8031) on a sandy hillside at Loma de Casma, in the province of Santa, Ancash, Peru, at an altitude of between 250 and 300 meters, on September 9, 1950, and is deposited in the United States Herbarium at Washington.

Collectors describe the plant as a low, sprawling, perennial herb, often prostrate, or a suffrutescent bush 30—60 cm. tall, spreading to form a low dome, the flowers fragrant, with a very strong sweet odor, and the corolla lilac, rose-color, pale pinkish lilac, or lavender, or "white to very pale-lavender with yellowish centers". Ferreyra says "las raices son casi superficiales, formando como almohadillados".

It has been found on sandy mountain slopes, in dry loose sandy soil, and on arid hills above the ocean in the fog belt vegetation, at altitudes of 40 to 2900 meters, flowering in March, September, and November. Worth & Morrison report that it is "general on slopes and sand flats" and Mexia terms it "common". A vernacular name recorded for it is "tacpa". Its leaves resemble those of *V. trifida* H.B.K. in width and color, but the spreading, rather than closely appressed, pubescence distinguishes our plant at once from this species and from the typical form of *V. clavata* Ruíz & Pav., with which it has sometimes been confused in herbaria.

In all, 9 herbarium specimens, including the type, have been examined by me.

Citations: PERU: Ancash: R. Ferreyra 8031 (W—2028584—type), 8035 (N, W--2028586), 8041 (W—2049544); Stork, Horton, & Vargas 9184 (Ca—639439, Ca--647043). Arequipa: Mexia 4170 (Ca—561809); Worth & Morrison 15719 (Ca—656668). Tacna: Weberbauer 7385 (W—1474546).

xVERBENA CLEMENSORUM Moldenke, Phytologia 2: 421—422. 1948.

Bibliography: Moldenke, Phytologia 2: 421--422. 1948; Moldenke, Castanea 13: 113. 1948; Moldenke, Alph. List Cit. 4: 1205. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 27 & 197. 1949; Howell, Wasmann Journ. Biol. 10: 377. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Am. Midl. Nat. 59: 344. 1958; Moldenke, Résumé 33, 371, 373, & 471. 1959.

Coarse herb, apparently quite tall and much-branched; stems and branches rather acutely tetragonal, striate-canaliculate, glabrous; nodes annulate; principal internodes mostly elongate, 3.5—6.5 cm. long; leaves chartaceous, stiff, uniformly green on both surfaces, ovate in outline, deeply and irregularly incised, the larger more or less 3-lobed, 2.5—8 cm. long, 1--3 cm. wide, the smaller ones very scabrous above, the larger ones glabrous or scabrous-margined, all more or less scabrous beneath (especially the smaller ones just beneath the inflorescence), the slender midrib and secondaries usually impressed above and quite prominent beneath, the margins usually more or less subrevolute; petioles absent or so slightly alate as to merge completely with the leaf-blade; inflorescence spicate, compound, the peduncles and rachis acutely tetragonal, minutely and rather sparsely puberulent-pulverulent, apparently somewhat glandular, the floriferous portion of the spikes elongate (often to 20 cm. long), rather densely flowered; bractlets ovate, upwardly curvate, about 2 mm. long, subacuminate at the apex, keeled on the back, minutely puberulent-pulverulent on the back, ciliolate-margined, about equaling or slightly shorter than the calyx; calyx 2--2.5 mm. long, glandular-puberulent; corolla-tube about 3 mm. long, subglabrate or very minutely pulverulent outside, the limb about 2 mm. wide; cocci about 1.6 mm. long.

The type of this natural hybrid was collected by Mary Knapp Clemens at Jackson, Amador County, California, on September 13, 1920, and is deposited in the herbarium of the California Academy of Sciences in San Francisco. It is named in honor of Mrs. Clemens and her husband, Joseph Clemens, who have done such noteworthy collecting of members of this group in Michigan, Oklahoma, Texas, Utah, California, the Philippines, Australia, and French Indochina. The plant seems to be a hybrid, but its parentage is not certain. *Verbena officinalis* L. is probably one parent, and the other may well be *V. robusta* Greene, as both these species are known to occur in Amador County. They both also occur in San Diego County, and the hybrid may therefore be expected there, too. Otherwise there seems little opportunity for the two species to come together in the wild state. *V. officinalis* is an Old World species, introduced and naturalized in some parts of the United States, while *V. robusta* is a species found only in California, the Channel Islands, and the Mexican state of Baja California. The hybrid is known thus far only from the type collection.

In all, 2 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: CALIFORNIA: Amador Co.: *M. K. Clemens s.n.* [Jackson, Sept. 13, 1920] (F--photo of type, Gg--31394--type, N--isotype, N--photo of type, Si--photo of type, Z--photo of type).

VERBENA CLOVERAE Moldenke, Am. Midl. Nat. 24: 751--752 [as "cloveri"]. 1940; Known Geogr. Distrib. Verbenac., [ed. 2], 23 & 197. 1949.

Synonymy: *Verbena cloveri* var. *lilacina* Moldenke, Phytologia 2: 23--24. 1941. *Verbena neomexicana* var. *grandiflora* Moldenke, Suppl. List Invalid Names 9, in syn. (1941); Alph. List Cit. 2: 596, hyponym. 1948. *Verbena cloverii* Moldenke, Résumé Suppl. 3: 37, in syn. 1962. *Verbena cloveri* var. *cloveri* [McCart], in herb.

Bibliography: Moldenke, Am. Midl. Nat. 24: 751--752. 1940; Moldenke, Phytologia 2: 23--24. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 16, 17, & 29. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13 & 101. 1942; Moldenke, Phytologia 2: 128 (1945), 2: 162. 1946; Moldenke, Alph. List Cit. 1: 111, 125, & 282. 1946; Moldenke, Phytologia 2: 328. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Alph. List Cit. 2: 596. 1948; Moldenke, Wrightia 1: 227. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 54. 1948; Moldenke, Alph. List Cit. 2: 477 (1948), 3: 678--683, 741, 784, 822, 843, 882, & 936 (1949), and 4: 990, 991, 1138, 1170, 1207, & 1242. 1949; Moldenke, Phytologia 3: 132. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 23 & 197. 1949; Moldenke, Am. Wild Fls. 293 & 450. 1949; Moldenke, Résumé 29, 362, 370, 418, & 471. 1959; Lewis & Oliver, Am. Journ. Bot. 48: 639--641. 1961; Moldenke, Résumé Suppl. 3: 7, 10, & 37. 1962.

Illustrations: Lewis & Oliver, Am. Journ. Bot. 48: 640. 1961.

Erect annual or perennial herb, woody at the base, branching from near the base; roots fibrous; bark green; branches rather sharply 4- or 5-angled, densely short-villous, the hairs standing at right angles to the branches, not gland-tipped; cauline leaves petiolate; petioles 0.5--1.5 cm. long, broadly winged to the base; leaf-blades rather firm, resembling those of *V. plicata* Greene, mostly ovate in outline, those on the main branches 1.5--3 cm. long, 1--2.5 cm. wide, coarsely and irregularly incised-dentate or shallowly 3-lobed toward the base, shortly and obscurely puberulent above, more densely short-pubescent (especially along the larger venation) beneath; the entire venation impressed above and very prominent and whitish beneath as in *V. plicata*; leaves in the inflorescence small, sessile or subsessile to shortly winged-petiolate, sharply and coarsely incised-dentate or lobed, firm and rather stiff, rapidly decreasing in size upwards; spikes 8--25 cm. long; rachis pubescence often short and densely glandular; bractlets lanceolate, stiff, the lowermost to 7 mm. long, the uppermost 2.5--3 mm. long, shorter than the calyx during anthesis, often short-pubescent and densely glandular; calyx 4--4.5 mm. long, prominently 4-ribbed, purplish as in *Stylodon carneus* (Medic.) Moldenke before and during anthesis, often short-pubescent and densely glandular, the ribs often hirsute like the branches; corolla hypocrateriform, varying from blue, bluish-lavender, or bluish-purple to lavender, lilac, purplish, pale-purple, or purple, or actually pink when fresh (with a faint lavender tinge) and becoming pale-lavender only after drying, or even "white" [*Tharp & York 27*], the tube far surpassing the calyx, 8 or more mm. long, the limb 7--8 mm. wide; chromosome number: n = 7.

The type of this handsome species was collected by Elzada Urseba Clover (*no. 1618*) -- in whose honor it is named -- four miles north of Rio Grande City, Starr County, Texas, on January 11, 1934, and is deposited in the Britton Herbarium at the New York Botanical Garden. The specific epithet was originally published as "*cloveri*", but under the present International Rules of Botanic Nomenclature the names of taxa named after women should end in "*-ae*". The type of var. *lilacina* was collected by Cyrus Longworth Lundell and Amelia A. Lundell (*no. 10142*) off United States Highway 81 near Millett, LaSalle County, Texas, on April 9, 1941, and is deposited in the same herbarium. It is said to differ from the typical form of the species in the pubescence on the rachis, bractlets, and calyx being much shorter and densely glandular and in the corolla being lavender instead of purple. *Nos. 10140* and *10141* of the same collectors apparently represent the same entity. Mr. L. I. Davis, however — to whom we are indebted for so much accurate field knowledge of members of this genus — states that "our friend Thelma Walker doubts that a lavender flowered V. cloveri could be considered a valid variety since she says all of the flowers are slightly on the lavender side of blue and she thinks every shade of intergrade is found. She has a much better chance to study that species....as her farm is literally covered with the plants in the spring." Both Mr. Davis and Miss Walker have called my attention to the fact that the flowers are actually pink when fresh (with a faint lavender tinge) and become pale-lavender only after drying. Tharp & York 27 is described by the collectors as having white flowers; if so, it may deserve a special form designation. Molby 7221 was annotated by Perry as "cf. V. plicata".

The species is apparently endemic to Texas and Chihuahua, being found in clay, sandy, tight, red or reddish sandy, sandy loam, and sandy gravelly soil, in loose sand or brickred-colored loose sand, on open slopes, sandy mesquite prairies, stony hills, open grassy banks, open scrub and open desert scrub, and sandy uplands, in open fields, along roadsides, in woods, and on the sandy bottoms of floodplains, at altitudes of about 50 meters, in central and southern Texas, from Coke and Houston south to Webb and Hidalgo Counties, blooming from January to May, August, September, and December, and in fruit from March to May, August, and September.

Runyon states that V. cloverae is "frequent in the west edge of Hidalgo County bordering Highway 83". The Tharp s.n. cited below from Medina County may actually have come from Frio County, as its label is merely inscribed "Devine-Dilley". Johnston, Tharp, and Turner found the species in "low scrub vegetation", while Tharp, Johnston, and Webster found it "in Catahoula tuff". Martinez encountered it in sandy soil with gravel on top and deep subsoil, "Bouteloua eriopoda dominante, pastizel de B. gracilis deteriorado."

Specimens of this species have been misidentified and distributed in herbaria under the names V. canescens var. roemeriana (Scheele) Perry, V. denticola Small, V. neomexicana (A. Gray) Small, V. neomexicana var. xylopoda Perry, V. officinalis L., V. plicata Greene, and V. xutha Lehm.

On the other hand, the McCart 7288, distributed as V. cloveri var. lilacina, is actually V. plicata Greene.

In all, 115 herbarium specimens, including the types of all the names involved, and 2 mounted clippings have been examined by me.

Citations: TEXAS: Brooks Co.: Cory 55262 (W—2007446); C. L. Lundell 10823 (N, Rf, W--1926936); Lundell & Lundell 8834 (Ld, Mi, Mi, N, N), 10072 (Ld, N, W—1888889); Painter & Barkley 14315 (Au, Au, N); Pladeck s.n. [near Falfurrias, 5-5-1940] (Bt-51188). Coke Co.: Parks & Cory 13890 (Tr). Dimmit Co.: D. S.

Correll 20734 (Rf), 20786 (Rf); Hamby 952 (Ar--206757); Johnston, Tharp, & Turner 3550 (Au--122040); Stewart & McCart 18 (Ok); Tharp & York 27 (Au--193914). Duval Co.: Alvarez, Guajardo, Salazar, & McCart 7657 (Ok). Edwards Co.: H. R. Reed 47 (N). Frio Co.: Johnston, Tharp, & Turner 3462 (Au--122042, St); Lucas, Painter, & Barkley 14230 (S, Ur); C. L. Lundell 13618 (Rf, Si, W-1926978); Lundell & Lundell 10140 (Ld, Mi, N, N, Rf, W--1835856), 13618 (N); Painter, Lucas, & Barkley 14230 (Au); H. R. Reed s.n. [Cory 27849] (N); Tharp s.n. [Dilley, 2-27-30] (Sm); Wolcott & Barkley 16271T (Au, N, S). Hidalgo Co.: Clover 578 (Du--247822, Mi); R. Runyon 2611 (N, N, N, N, N). Houston Co.: Molby 7221 (Au, Au, W--1465431). Jim Hogg Co.: Salazar & Santos 25 (Ok); Tharp, Johnston, & Webster 48-70 (Au--122052). Kenedy Co.: M. C. Johnston 541120 (Au--122041); Lundell & Lundell 10843 (N, Rf, W--1926937). Kleberg Co.: Hamby 1637 (Ar--251840, Rf); M. C. Johnston 53253.6 (Au--122044), 53253.7 (Au--122043, St); R. L. Olivver 111 (Nb); J. F. Sinclair s.n. [Kingsville, Spring, 1940] (Au). LaSalle Co.: Alvarez, Guajardo, Salazar, & McCart 7614 (Ok); F. A. Barkley 17T078 (Au, Au--178088, N); Lundell & Lundell 10142 (Ld, Mi, N); Ramirez & Perales 17 (Ok). Medina Co.: D. S. Correll 15205 (Rf, W--2178999); Tharp s.n. [Devine-Dilley, Feb. 27, 1930] (Au). Starr Co.: Clover 1618 (Fs--isotype, Fs--isotype, Mi--isotype, N--type); Lundell & Lundell 9795 (Ld, N, W--1887594), 9886 (Ld, N, W--1887598); Ripley & Barneby 9044 (N). Webb Co.: Cantu, Covell, & McCart 10 (Ok, Ok); Correll & Schweinfurth 15728 (Rf); Johnston, Tharp, & Turner 3500 (Au--122056, St); M. E. Jones 29188 (Ca--483601, Po--199867); Lundell & Lundell 10107 (Ld, Mi, N, Rf), 10141 (N); McCart 7289 (Ok, Ok); Tharp 8737 (Au), s.n. [3-15-31] (Mi). Zapata Co.: Cantu, Covell, & McCart 36 (Ok); D. S. Correll 15701 (Rf); Lundell & Lundell 10112 (Ld, N), 15052 (N, Rf, W--2297884); Ramos, Sandoval, Salazar, & McCart 7846 (Ok). MEXICO: Chihuahua: F. Martinez M.110 (Au--181446). MOUNTED CLIPPINGS: Am. Midl. Nat. 24: 751. 1940 (W); Phytologia 2: 23. 1941 (W).

VERBENA COCHABAMBENSIS Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 97 & 197, nom. nud. 1942; Castanea 10: 45. 1945.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 97 & 197. 1942; Moldenke, Castanea 10: 42 & 45--46. 1945; Moldenke, Alph. List Cit. 4: 1198. 1949; Moldenke, Phytologia 4: 71. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 262. 1953; Moldenke, Résumé 115 & 471. 1959.

Perennial herb, 15--50 cm. tall, mostly with single erect stems, but sometimes forming procumbent partial rosettes; stems and branches slender, tetragonal, densely pubescent with short, spreading, whitish hairs; nodes annulate; principal internodes 2.2—5.8 cm. long; leaves decussate-opposite; petioles 2—12 mm. long, flat, winged, about 1 mm. wide, spreading-pubescent with whitish hairs, canaliculate above; leaf-blades pinnatisect, light-green, 1—2 cm. long, 1.5—2 cm. wide, spreading-pubescent with white hairs like those on the petioles and stems, usually with 2 or 3 lobes on each side, the lower pair usually bifurcate, the central portion along the midrib about 1 mm. wide, with the midrib impressed above, prominulous beneath, the lobes also all about 1 mm. wide, acute at the apex; inflorescence terminal, spicate; peduncles slender, 1.5—7 cm. long, spreading-pubescent like the stems; spikes elongating to 10 cm. in fruit, densely flowered; rachis slender, more or less spreading-pubescent; bractlets broadly elliptic or elliptic-ovate, sessile, 3—4 mm. long, 1.5—2 mm. wide, about half as long as the calyx, acute at the apex, whitish-pubescent; calyx tubular, about 6 mm. long, its limb about 4 mm. wide; corolla blue-lilac or purple; fruiting-calyx and fruit not known.

The type of this species was collected by my good friend and colleague, Martin Cárdenas (no. 2212) at Maica, at an altitude of 2500 meters, Cochabamba, Bolivia, in March, 1941, and is deposited in the Britton Herbarium at the New York Botanical Garden. The short broad bractlets are most characteristic. The species is said to be common on mountain slopes, and has been found among stones in sand and gravel of dry formations, from 1900 to 2700 meters altitude, flowering in December, January, and March.

In all, 6 herbarium specimens, including the type, have been examined by me.

Citations: BOLIVIA: Cochabamba: W. M. A. Brooke 5030 (Bm); Cárdenas 2212 (N—type); Eyerdam 24656 (Ca—652405); Ochoa 650 (N); Troll 1293 (B). Sucre: Hammarlund 347 (S).

xVERBENA CONATA Moldenke, Am. Midl. Nat. 59: 344. 1958.

Synonymy: Verbena halei x officinalis Dermen, Cytologia 7: 170. 1936. xVerbena adulterina Moldenke, Phytologia 5: 132. 1955 [not xV. adulterina Hausskn., 1889].

Bibliography: Nyman, Consp. Fl. Eur. Suppl. 2 (1): 245. 1889; Hausskn., Mittheil. Thüring. Bot. Ver., new ser., 10: 65. 1897; Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 3: 467 (1951) and 5: 132. 1955; Moldenke, Am. Midl. Nat. 59: 342 & 344. 1958; Moldenke, Résumé 223, 357, 365, 371, & 471. 1959.

This name has been proposed for the hybrid produced artificially by Dermen in Massachusetts between V. officinalis L. and V. halei Small. It was first named xV. adulterina by me in 1955, but, unfortunately, that name is invalidated by the earlier xV. adulterina Hausskn., of which I was not cognizant at the time. Haussknecht's name applies to the natural hybrid between V. officinalis and V. supina L.

V. officinalis and V. halei grow together in Plaquemines Parish, Louisiana, but this is the only place that I know of where the hybrid might occur in Nature. It would be most difficult to recognize in the field because of the very close similarity of the parental species to each other. Lack of abundant fruit production would probably be the quickest and easiest way to locate it. Both *V. officinalis* and *V. halei* normally produce great quantities of fruit.

VERBENA CONCEPCIONIS Moldenke, Phytologia 2: 236. 1947.

Bibliography: Moldenke, Phytologia 2: 236 & 338. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 197. 1949; Moldenke, Alph. List Cit. 3: 766. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 121 & 471. 1959.

Herb, about 40 cm. tall; stems erect, branched to the base, sparingly hirsute with stiff white hairs about 1 mm. long and standing at right angles to the stem; branches slender, each terminating, like the stem, in a single elongated spike, hirsutulous, less so in age; principal internodes 2—6.5 cm. long; leaves decussate-opposite, or the upper ones subopposite (like the branches), sessile; leaf-blades chartaceous, uniformly light-green on both surfaces, 2—2.8 cm. long, 10—21 mm. wide, widest at about the middle or slightly below, abruptly acute at the apex, long-cuneate at the base, irregularly 3-lobed, each lobe about 3-dentate with coarse subacute teeth, rough and strigose above, strigose-pubescent beneath, the venation somewhat impressed above and prominulous beneath; peduncles slender, continuous with the stems or branches, 2—6 cm. long, sparsely hirsutulous like the stems and branches; spikes many-flowered, at first dense, later elongating to 12 cm., with the fruits rather distant toward the base, more crowded toward the apex and with foliaceous bracts often subtending the lower pairs of fruits; bractlets narrow-lanceolate, about 3 mm. long, strigillose-hirsutulous, sharply attenuate-acute at the apex, almost equaling the fruiting-calyx; rachis short-pubescent and somewhat glandular; calyx about 3 mm. long, strigose with rather long white hairs and often also somewhat glandular-puberulent; corolla-tube about 5 mm. long, puberulent outside above the calyx, its limb about 2 mm. wide; fruiting-calyx not accrescent, strigose and somewhat glandular-puberulent.

The type of this perplexing species was collected by Louis Née (*no. 57*) at Concepcion, Chile, between 1789 and 1791, and is deposited in the herbarium of the Jardin Botanico at Madrid. The plant, known only from the type collection, is strikingly similar to the Mexican *V. menthaefolia* Benth., and I am wondering whether the Chilean locality may not be a case of mis-labeling. The type specimen was originally identified as *V. trifida* H.B.K. and actually bears two labels: one reads "*Verbena* ex Regno Chilensi. Née iter", while the other reads "*Verbena trifida* H.B.K. de la Concepcion de Chile. Née iter." Née collected both in Mexico and in Chile, so it seems quite possible that the specimen actually came from Mexico; if so, it should certainly be referred to V. menthaefolia.

In all, only 2 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: CHILE: Concepcion: Née 57 (F--photo of type, F--photo of type, N--isotype, N--photo of type, Q--type, Z--photo of type).

xVERBENA CORRUPTA Moldenke, Phytologia 5: 132--133. 1955.

Synonymy: Verbena peruviana x phlogiphlora Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 20. 1942. Glandularia peruviana x phlogiphlora Schnack & Covas, Darwiniana 7: 73--75, pl. 3, fig. E. 1945. Verbena peruviana x phlogiflora Dermen ex Moldenke, Résumé Suppl. 2: 12, in syn. 1960.

Bibliography: Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 20. 1942; Schnack & Covas, Darwiniana 6: 472 (1944) and 7: 73--75, pl. 3, fig. E. 1945; Moldenke, Phytologia 3: 467 (1951) and 5: 132--133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 344--345. 1958; Moldenke, Résumé 223, 296, 372, & 471. 1959; Moldenke, Résumé Suppl. 2: 12. 1960.

Illustrations: Schnack & Covas, Darwiniana 7: pl. 3, fig. E. 1945.

This name has been proposed for the artificial hybrid produced in Argentina between V. peruviana (L.) Britton and V. phlogiflora Cham. The two parental species grow together in at least two states of Brazil, in Paraguay, in Uruguay, and in at least two provinces of Argentina. It is, therefore, quite probable that this hybrid occurs there in the natural state. It should have considerable horticultural merit and should also be of interest in possibly shedding light on the supposed origin of the common garden verbena known as xV. hybrida Voss.

VERBENA CORYMBOSA Ruíz & Pav., Fl. Peruv. & Chil. 1: 22, pl. 33a, fig. 1--5. 1798 [not V. corymbosa Cham., 1832, nor Hort., 1845, nor Relh., 1947].

Synonymy: Zapania corymbosa (Ruíz & Pav.) Poir. in Lam., Encycl. Méth. Bot. 8: 844. 1808. Zapania corymbosa Poir. ex Schau. in A. DC., Prodr. 11: 540, in syn. 1847. Verbena aspera Kunze ex Walp., Repert. Bot. Syst. 4: 33, nom. nud. 1845 [not V. aspera Gill. & Hook., 1830, nor Hügel, 1936]. Verbena arechavaletae Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena palustris Poepp. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947.

Bibliography: Ruíz & Pav., Fl. Peruv. & Chil. 1: 22, pl. 33a, fig. 1--5. 1798; Poir. in Lam., Encycl. Méth Bot. 8: 844. 1808; J. Sm. in Rees, Cycl. 36: no. 20, 1817; Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825; Cham., Linnaea 7: 255. 1832; Walp., Repert. Syst. Bot. 4: 26--27 & 33. 1845; Schau. in A. DC., Prodr. 11: 539--540. 1847; C. Gay, Hist. Chile Bot. 5: 23. 1849; Jacks., Ind. Kew. 2: 1178. 1895; Reiche, Fl. Chile 5: 283 & 285. 1910; Gard. Chron., ser. 3, 86: 58 & 63. 1929; Journ. Roy. Hort. Soc. Lond. 55, Proc. 131. 1930; C. Elliott, Gard. Chron., ser. 3, 90: 290. 1931; Stapf, Ind. Lond. 6: 429. 1931; Milne-Redhead in Curtis, Bot. Mag. 157: pl. 9361. 1934; L. H. Bailey, Cat. Florists Handl. Verbenac. mss. 1935; Moldenke, Prelim. Alph. List Invalid Names 54. 1940; Moldenke, Suppl. List Common Names 6 & 23. 1940; Worsdell, Ind. Lond. Suppl. 2: 486. 1941; Moldenke, Lilloa 6: 326 (1941) and 8: 429. 1942; Moldenke, Alph. List Invalid Names 57. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35, 42, & 101. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 19. 1942; Schnack & Covas, Darwiniana 6: 470. 1944; Moldenke, Lilloa 10: 346. 1944; Darlington & Janaki Ammal, Chromosome Atl. 270. 1945; Moldenke, Phytologia 2: 114. 1945; Moldenke, Alph. List Cit. 1: 6 & 59. 1946; Moldenke, Phytologia 2: 337. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 26. 1947; Moldenke, Castanea 13: 117 & 121. 1948; Moldenke, Alph. List Cit. 2: 457, 554, & 571 (1948), 3: 671, 672, 766, 781, 811, 812, 823, & 840 (1949), and 4: 1104, 1116, 1117, 1166, 1187, & 1191. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 94, 100, 101, 164, & 197. 1949; Moldenke, Am. Wild Fls. 364 & 450. 1949; C. Elliott, Illustr. Lond. News 217: no. 5810, August 26. 1950; Moldenke, Phytologia 3: 288 (1950) and 3: 467. 1951; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 53. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208—2210. 1951; Moldenke, Phytologia 5: 96. 1954; Moldenke, Journ. Calif. Hort. Soc. 15: 82. 1954; Moldenke, Résumé 84, 110, 119, 121, 223, 357, 371, 393, & 471. 1959; Reitz, Sellowia 11: 57 & 134. 1959; T. H. Everett, New Illustr. Encycl. Gard. 13: 2404. 1960; Moldenke, Résumé Suppl. 2: 10. 1960; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Moldenke, Résumé Suppl. 3: 42. 1962.

Illustrations: Ruíz & Pav., Fl. Peruv. & Chil. 1: pl. 33a, fig. 1--5. 1798; Milne-Redhead in Curtis, Bot. Mag. 167: pl. 9361 (in color). 1934; C. Elliott, Illustr. Lond. News 217: no. 5810, fig. 1 & 2, August 26. 1950.

Perennial herb, 1 m. or less in height, spreading underground by means of a creeping rhizome; stems erect, simple or corymbosely branched above, 4-angled, striate, leafy, more or less pilose-hispidulous throughout; principal internodes 5--9 cm. long; leaves decussate-opposite, very short-petiolate or subsessile; leaf-blades varying from oblong or ovate to subcordate-ovate, often subtriangular or cordate-triangular, 2.5—6.5 cm. long, 1.2—2.5 cm. wide, paler beneath, rigid, acute at the apex, truncate at the base, subrevolute-margined, strigose-hispidulous or densely appressed-pilose on both surfaces, unequally mucronate-dentate or deeply incised-serrate, often with a small entire or toothed lobe on each side near the base, reticulate-veined and rugose with deeply impressed venation above, the venation prominent beneath, the upper ones usually with a non-cordate base, the lower ones often subtrilobed; inflorescence a terminal corymbose panicle, the spikes short, about 2.5

cm. long, numerous, very dense, mostly ternate or subternate, the flowers imbricate; peduncles short; bractlets linear or ovate, from half as long as to almost equaling or even surpassing the calyx, subulate-acuminate at the apex, pilose-setose on both surfaces, ciliate-margined; calyx cylindric, 5--6 mm. long, pilose-setose or glandular-hirtous, its rim shortly 5-denticulate or subulate-5-fid; corolla blue or violet, its tube twice as long as the calyx, slender, usually reddish-purple, puberulent on the outside, lanuginous in the throat, the limb medium in size, usually heliotrope-blue, the lobes about 4 mm. long, retuse at the apex; fruit about half as long as the mature calyx; chromosome number: 2n = 56.

The type of this distinctive species was collected by Hipólito Ruíz and José Antonio Pavon somewhere in Chile. The type of *V. palustris* was collected by Eduard Friedrich Poeppig (*III.157* -- cited by Schauer as "II.157") at Laguna de San José Cantera, on the island of Laxa [Laja], Bío-Bío, Chile, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. The type of *V. aspera* is also a Poeppig collection in the Berlin or DeCandolle herbarium. The type of *V. arechavaletae* was collected by José Arechavaleta [*Herb. Osten 3745*] in a swamp at Bañados de Carrasco, department of Montevideo, Uruguay, and is deposited in the herbarium of the Museo National at Montevideo. Osten, on August 20, 1899, described it as follows: "*Verbenaca, Pachystachyae* -- juxta V. ovatam Cham. inserrenda. Rhizomate repente, caulibus angulatis, ascendentibus apice ramosis, superne ramisque glanduloso-villosis, strigosisque scabris. Foliis oppositis ovatis acutis, grosse crenatis, subcordatis, brevissime petiolatis vel subsessilibus, supra rugosis strigisque subcallosis scaberrimis, subtus in rete prominente praecipue hirsutis. Panicula terminali contracta, spicis cylindricis imbricatis, bracteis lanceolatis margine longe ciliatis calycem subaequantibus, corollae violaceae (?) tubo extus villoso, calycem 1/3 excedente." Apparently he never published this description, and later he changed his determination of the specimen to *V. ovata* Cham.

The species inhabits mostly wet soil, and has been found in marshes. bogs, swamps, river banks, wet thickets, damp depressions,wet places, and low wet places in general; also on campos, in virgin forests, in turf on dunes, and on rocky crests, at altitudes of 50 to 1650 meters, blooming from October to February. It has been collected in fruit in December. In cultivation in the Northern Hemisphere it is said to be hardy, blooming in summer, and growing best in moist soil in sunshine. It was introduced into cultivation in 1928. Rambo has found it in a region of 2 meters rainfall and 0° to 25° temperature. Reitz & Klein describe the corolla as "roxa".

Bailey (1935) says that its seeds are offered in the horticultural trade by Kew and Lissadell. The *J. T. Howell s.n.* cultivated at San Francisco, California, on June 16, 1941, was grown from seed collected in Chile by Clarence Elliott, who describes the plant as follows: "I collected one other *Verbena* in Chile, *Verbena corymbosa*, a herbaceous plant, and in some ways perhaps the most valuable of them all for garden purposes. I saw it first from the train as we neared Valdivia. Every stream and ditch was lined with violet, which turned out to be this *Verbena*. It's a splendid plant, both as a feature in the landscape and as a slab of colour in the flower border. A group of a dozen specimens planted two years ago in my garden has been in flower for several weeks, and is good for several more. They have grown together into a patch about 6 ft. by 3 ft., which now, in mid-August, has all the appearance, in colour and in individual flower-heads, of a clump of particularly well-grown, well-flowered heliotrope. The resemblance is quite remarkable, and, oddly enough, the flowers have the true heliotrope scent, though it is not quite so heavily overpowering. *Verbena corymbosa* has received the Award of Merit R. H. S., and has been figured in the 'Botanical Magazine.' Although in nature a damp-loving plant, it grows and flowers to perfection in good loam in the herbaceous border. I have found it quite reliably hardy, and one of the easiest things in the world to propagate from cuttings. In flower it stands about 18 ins. high, and so is best suited for the front of the border, and though I have not tried it as a waterside plant, I have not the least doubt that it would flourish there, as it does by the streams around Valdivia. I once saw a magnificent border of *Verbena corymbosa* in a Cheshire garden. It was 3 ft. wide, 30 or 40 yards long, and a solid mass of heliotrope from end to end. And yet this jolly plant of many virtues is comparatively little known. Can it be that on seeing it growing in a garden folk conclude that a plant so very like a heliotrope could not possibly be hardy? That may be the reason. Perhaps the plant's greatest virtue is that, being without a touch of vulgarity, it is never likely to be over-planted and vulgarised. But I wish more really nice gardeners would wake up to the beauty and good nature of my Chilean ditch weed."

Reiche (1910) says "Planta ornamental de los matorrales húmedos desde la provincia de Concepcion a Valdivia. Enero, Febrero." Everett (1960) says "*Verbena corymbosa* is a herbaceous plant of running habit, forming clumps of dark-green, rough foliage; in June and July it throws up numerous erect branched stems carrying heads of flowers of purple and red-violet color with the delicious fragrance of Heliotrope. The plant is hardy in milder parts of North America and thrives in moist, loamy soil. It has value in the flower border and as a cut flower. It was introduced into cultivation from southern Chile in 1928. *V. corymbosa* is easily propagated by division of the roots, by cuttings taken in spring and rooted in sand in a cold frame, or from seeds sown in a mixture of loam, leaf mold or peat moss and sand in a cold frame."

Common names reported for the species are "camaradinha", "correcaballito", "corymbose Chili vervain", "corymbose vervain", "formosa sem dote", "jurupeba", "verbena", and "verbena correcabillito". The three names before the final one in this list, however, are applied to many other species of this genus and even to related genera.

Specimens of V. corymbosa have been misidentified and distributed in herbaria under the names V. bonariensis L., V. hispida Ruíz & Pav., V. venosa Gill. & Hook., and even Stachys sp. in the Lamiaceae.

It is worthy of note here that the Verbena aspera of Gillies & Hooker is Junellia aspera (Gill. & Hook.) Moldenke, while that of Hügel is Priva cordifolia (L. f.) Druce, and the V. corymbosa of Chamisso [who says "E Brasilia misit Sellowius pluribus locis lectam"] and of Relh. is V. lobata Vell., while V. corymbosa Hort. is V. bonariensis L. Walpers (1845) gives V. lobata Arrab. as a synonym of V. corymbosa Ruíz & Pav., but actually this name belongs in the synonymy of V. lobata Vell., a very different Brazilian species. Walpers classifies our plant in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae and Secondary Subgroup Melindres with ten other species. He also claims that our plant has much of the habit of a Thalictrum.

Schauer cites Dombey 264 from Peru in the Berlin or DeCandolle herbarium. Acevedo de Vargas (1951) cites the following 7 specimens not as yet seen by me: CHILE: Curicó: Collector undesignated s.n. [XII.1861] (Sg--42453). Ñuble: J. Gallardo s.n. [11.XI.1947] (Sg--66315). Valdivia: Collector undesignated s.n. [S. Juan, I. 1886] (Sg--68336), s.n. [II.1862] (Sg--42456); Philippi s.n. [I. 1861] (Sg--54699), s.n. [II.1878] (Sg--42448, Sg--54698).

In all, 62 herbarium specimens, including the types of several of the names involved, have been examined by me.

Citations: BRAZIL: Paraná: Hatschbach 4223 (Ok). Rio Grande do Sul: Rambo 34724 (Gg--354823, N, S), 49364 (N, S); A. R. Schultz 506 (N); Sehnem 4155 (B). Santa Catarina: Reitz 2334 (N), 3261 (N), 3770 (S, S); Reitz & Klein 8211 (Mm); Smith & Reitz 8977 (Ok, W--2251475), 10177 (N, Ok, W--2251657), 10463 (Ok, W--2251681). URUGUAY: Arechavaleta 35 [3136] (Ug), 85 (Ug), s.n. [Bañados de Carrasco; Herb. Osten 3745] (Ug); Gallinal s.n. (Ug--5844); Legrand 1366 (Ug), 4323 (Ug); Lombardo 3113 (N); Osten 4052 (Ug). CHILE: Bío-Bío: Poeppig III.157 (Br). Cautín: Claude-Joseph 1889 (W--1122289); Hollermayer 62 (B); Pfister XVI [Looser 4380] (N); Sparre 3520 (S). Malleco: Kunkel 416 (Z). Valdivia: Alcibiades Santa Cruz s.n. [Cordillera de la Costa, 1938] (Ba); Barros Valenzuela 8043 (N); Bridges 784 (M, M), s.n. (Br); Buchtien s.n. [Cutipai, 18/2/1904] (S, Vt), s.n. [Cutipai, Feb. 1904] (W--1159369); Gunckel 3053 (W--1618821), 13766 (N); Herb. Mus. Nac. Chile 2 (N); Hollermayer s.n. [Werdermann 1170] (Bm, Ca--

323056, Gg--149971, N, S, Ut--91126, W--1516845); *H. Krause s.n.* [Coral] (W--1690232); *Kunkel s.n.* [Jan. 14, 1959] (Sm); *R. A. Philippi s.n.* [Valdivia] (W--1323078). Province undetermined: *Claude-Joseph 5823* (W--1444388); *Née 91* [Coscolen] (Q); *R. A. Philippi 297* (S). CULTIVATED: California: *J. T. Howell s.n.* [San Francisco, June 16, 1941] (Gg--290629); *Walther s.n.* [Santa Monica, June 1930] (Gg--178810), *s.n.* [San Francisco, July 1, 1932] (Gg--195533); *J. West s.n.* [San Rafael, May 30, 1933] (Gg--214253).

xVERBENA COVASII Moldenke, Phytologia 2: 146. 1946.

Synonymy: *Glandularia santiaguensis* x *laciniata* Schnack & Covas, Darwiniana 7: 73--75 & 77--79, pl. 1, fig. D, & pl. 5, fig. A--G. 1945; Rev. Argent. Agronom. 12: 228. 1945.

Bibliography: Schnack & Covas, Darwiniana 7: 73--75 & 77--79, fig. 2B, pl. 1, fig. D, & pl. 5, fig. A--G. 1945; Schnack & Covas, Rev. Argent. Agronom. 12: 228. 1945; Schnack & Gonzalez, Rev. Argent. Agronom. 12: 290. 1945; Moldenke, Phytologia 2: 146. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10 & 26. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 164 & 197. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2210. 1951; Moldenke, Am. Midl. Nat. 59: 345. 1958; Moldenke, Résumé 223, 296, 373, 376, & 471. 1959.

Illustrations: Schnack & Covas, Darwiniana 7, fig. 2B, pl. 1, fig. D, & pl. 5, fig. A--G. 1945.

This name was proposed for the artificially produced hybrid between *V. santiaguensis* (Covas & Schnack) Moldenke and *V. tenuisecta* Briq. The two parental species grow together in Corrientes, Argentina, and the hybrid may be expected in the wild state there. It ought to have considerable horticultural merit and may therefore by worthy of further experimentation. In previous publications I regarded this as a hybrid between *V. santiaguensis* and *V. laciniata* (L.) Briq., but it appears most likely that what Schnack & Covas called "*Glandularia laciniata*" was actually *Verbena tenuisecta*. *Verbena laciniata* and *V. tenuisecta* grow together in at least two provinces of Argentina.

x*V. covasii* was first produced in 1945. Schnack & Covas describe it as follows: "En general el híbrido presenta caracteres intermedios con respecto a los de los padres. La pubescencia en toda la planta está formada por pelos oblicuos o apretados. La corola es de color pálido, exteriormente glabra. Las hojas (lámina V B, centro) y los mericarpios (fig. 2, B) son intermedios... La observación microscópica de los granos de polen tratados con lugol, indica una proporción de esterilidad próxima al 50 o/o (ver tabla I y lámina V A). Los granos de polen estériles son de tamaño normal, pero no dan la coloración típica de los granos fértiles tratados con lugol. En cambio en una de los padres, *G. santiaguensis*, en que también hay un 50 o/o de granos fértiles, los granos no funcionales son abortivos, es decir no adquieren

el tamaño de los granos fértiles y son de forma irregular.....En la lámina V C, D, E, F y G se presentan configuraciones cromosómicas observadas en distintos estudios de la meiosis del híbrido *G. santiaguensis* x *G. laciniata*. La relación evidente entre miembros de dos ares de cromosomas, como se observa en diplotene y en la cadena de cuatro cromosomas en diacinesis y metafase I, indican que *G. santiaguensis* x *G. laciniata* es un híbrido estructural, probablemente heterocigota para una translocación simple. Aunque hemos observado en varias ocasiones cadenas de cuatro cromosomas, no hemos encontrado anillos cromosómicos. La esterilidad del 50 o/o en el polen debe atribuirse a este comportamiento cromosómico aberrante."

VERBENA CRITHMIFOLIA Gill. & Hook. in Hook., Bot. Misc. 1: 169. 1829.

Synonymy: *Verbena crithmifolia* var. *latiloba* Speg., Anal. Soc. Cient. Argent. 53: 250. 1902. *Glandularia crithmifolia* (Gill. & Hook.) Schnack & Covas, Darwiniana 6: 475. 1944. *Verbena crithmifolia* Hook. & Arn. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. *Verbena crithmifolia* Gill. ex Moldenke, Lilloa 10: 382, in syn. 1944. *Verbena crithmifolia latiloba* Speg. ex Moldenke, Résumé 362, in syn. 1959. *Verbena critmifolia* Gill. & Hook. ex Moldenke, Résumé Suppl. 3: 37, in syn. 1962. *Landularia crithmifolia* Gill. & Hook., in herb.

Bibliography: Hook., Bot. Misc. 1: 169. 1829; Walp., Repert. Syst. Bot. 4: 30. 1845; Schau. in A. DC., Prodr. 11: 549 & 556. 1847; R. A. Phil., Anal. Univ. Chil. 35: 190. 1870; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 1, 150. 1878; Griseb., Abh. K. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 277. 1879; Lorentz & Niederl., Exped. Rio Negro 2 (bot.): 264. 1881; Jacks., Ind. Kew. 2: 1178. 1895; Kuntze, Rev. Gen. Pl. 3 (2): 255. 1898; Speg., Anal. Soc. Cient. Argent. 53 [Nov. Add. Fl. Patag. 2: repr. 72]: 249—250. 1902; Hauman-Merck, Anal. Mus. Nac. Nat. Hist. Buenos Aires 24: 415. 1913; Hicken, Physis 2: 114. 1916; Sanzin, Anal. Soc. Cient. Argent. Buenos Aires 88: 98, 131—132, & 134. 1919; Molfino, Physis 5: 22. 1921; Seckt, Rev. Univ. Nac. Cordoba 17: 90. 1930; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Lilloa 6: 326—327 (1941) and 8: 429. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Beetle, Bot. Review 9: 670. 1943; Schnack & Covas, Darwiniana 6: 475. 1944; Moldenke, Lilloa 10: 382--383. 1944; Ind. Taxon. 1 (14--16): 6. 1945; Covas & Schnack, Revist. Argent. Agronom. 12: 59. 1945; Cabrera, Bol. Soc. Argent. Bot. 1: 67. 1945; P. I. Acuña, Cat. Fl. Catamarq. 30. 1945; Schnack & Covas, Darwiniana 7: 71, 72, 74, & 75. 1945; Covas & Schnack, Darwiniana 7: 85. 1945; Moldenke, Phytologia 2: 68 & 114. 1945; Schnack & Covas, Bol. Soc. Argent. Bot. 1: 282. 1946; Moldenke, Alph. List Cit. 1: 84, 86, 95--97, 101, & 102. 1946; Moldenke, Phytologia 2: 335. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 9 & 23. 1947; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 2, 150. 1947; Molden-

ke, Alph. List Cit. 2: 375, 537, 575, 584, & 598 (1948), 3: 673, 696, 735, 766, 798, & 924 (1949), and 4: 1299. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 70, 105, & 197. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 12. 1949; Moldenke, Phytologia 3: 76 (1949) and 3: 290. 1950; J. H. Hunziker, Revist. Invest. Agric. 6 (2): 175, 183, & 192. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Résumé 80, 121, 127, 295, 362, & 471. 1959; Moldenke, Résumé Suppl. 3: 37. 1962.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. Buenos Aires 88: 132. 1919.

Erect perennial herb, 40--75 cm. tall, or semi-woody shrub or subshrub, scabrous or hispid throughout; leaves decussate-opposite, thick-textured, almost fleshy, bipinnatifid, scabrous with very short, erect, rigid hairs, the segments linear, generally more than 2.5 mm. wide, obtuse at the apex, canaliculate, revolute-margined; spikes oblong, dense; bractlets linear, with glandular hairs equal to or longer than the simple ones; flowers fragrant; calyx ovate-oblong, with glandular hairs equal to or longer than the simple ones, the teeth rather obtuse; corolla varying from clear-blue or light-blue to lilac, lavender, rose, violet, pale-violet, or purplish, or pale-purplish, sometimes lilac-white or whitish, twice as long as the calyx, with simple hairs on the outer surface; upper anthers with large, club-shaped, glandular appendages, exserted; pollen fertility about 93.2 o/o; mericarps acutely triquetrous, 5--6 mm. long, not recurved at the apex; chromosome number: 2n = 20.

The type of this species was collected by John Gillies in the Andes Mountains at or near Mendoza, Argentina. The original publication is given as "1830" by some authors, but the correct date seems to be 1829. The type of var. latiloba was collected at the junction of the Limay and Neuquen rivers in Patagonia.

The species is classified by Walpers (1845) in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia, with ten other species. Schauer (1847) places it among his "Species non satis notae" and suggests that it may be closely related to his V. pinnatisecta Schau. In his discussion of the latter he says "Proxima videtur V. crithmifoliae, quae vero ex descr. differt foliorum laciniis angustioribus linearibus, bracteis linearibus, calycis dentibus obtusiusculis et corolla calyce duplo longiore." I regard V. pinnatisecta as a synonym of V. filicaulis Schau., with which Schauer compares V. crithmifolia f. minor Gill. & Hook. [which I regard as a synonym of V. hookeriana (Covas & Schnack) Moldenke]. Covas & Schnack differentiate these two closely related species as follows:

1. Segments of the leaves generally less than 2 mm. wide; pubescence on the leaves subappressed; upper anthers without glandular appendages; glandular hairs on the bractlets and calyx shorter than the simple ones; pubescence on the exterior of the corolla mostly glandular; mericarps 4 mm.

long, recurved ventrally at the apex..........V. hookeriana.

1a. Segments of the leaves generally more than 2.5 mm. wide; pubescence on the leaves very short but erect and rigid, imparting a scabrous aspect; upper anthers with large club-shaped, exserted, glandular appendages; glandular hairs on the bractlets and calyx equal to or longer than the simple ones; pubescence on the exterior of the corolla simple, not glandular; mericarps 5--6 mm. long, not recurved at the apex...................................V. crithmifolia.

Verbena crithmifolia inhabits dry places in general, roadsides, very dry plateaus, hills, arroyos, conglomerate uplands, and dry rocky hills, and rock crevices on slopes in association with Opuntia, at altitudes of 50 to 3000 meters, flowering from September to April, fruiting in January and February. Semper says that it is "abundant in dry alluvial soil" in Mendoza, where Ruiz Leal also reports it as "abundant". The length of pistil in relation to the size of the pollen grains is discussed by Covas & Schnack in Darwiniana 7: 85 (1945). Hunziker reports that the species is employed as a blenorrhagic. Common names reported for it are "bichicho", "té de burro", and "yerba del incordio".

Hauman-Merck (1913) cites his no. 352 and Spegazzini 449 from Río Negro, Argentina, where it is said to be not rare in dry places between the Río Colorado and the Río Negro. The Castillanos s.n., Castillon s.n., Kuntze s.n., Kurtz 8440, Lorentz & Hieronymus s.n., and Schreiter 6428 & 10612, cited in Lilloa 6: 326--327 (1941) and 10: 382 (1944) as this species, and the Venturi 6725 & 6939, H. H. Bartlett 19918, 19934, 19955, 19550, 20149, & 20231, Isler 117a, Jörgensen 1019, Kuntze s.n. [San José de Morro, 3/1/92], Lorentz s.n. [Südlich von El Chañar, 28 Nov. 1871], T. Meyer 4090, Schreiter 10612 [Herb. Inst. Miguel Lillo 32861], and Troncoso 6021, distributed as this species, are all V. hookeriana (Covas & Schnack) Moldenke.

In all, 66 herbarium specimens, including the type collections of all the names involved, and 2 mounted photographs, have been examined by me.

Citations: ECUADOR: Guayas: Née 70 (Q), 82 (Q). CHILE: Ovalle: Barros Valenzuela 8009 (N). ARGENTINA: Buenos Aires: Chicchi 28 (N, N); Née 81 (Q). Catamarca: Job 1337 (N). Córdoba: Cabrera 6391 (N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 31202] (N); Lossen 8 (Ba). La Pampa: Cabrera 4362 (N); Chicchi 264 (N), 287 (N). La Rioja: Hieronymus & Niederlein 99 (Vt). Mendoza: F. A. Barkley 19Ar803 (N); H. H. Bartlett 19372 (Mi, W--1904440); Bodenbender s.n. [Herb. Kurtz 10010] (Ja, Ja--1839, N); Burkart, Troncoso, & Nicora 14270 (N); Gillies s.n. [Mendoza; Gillies & Hooker 857; Macbride photos 34346] (Kr--photo of isotype, Lu--isotype, N--photo of isotype); Jensen-Haarup s.n. [St. Rosa] (Cp, N--photo, Z--photo); Jörgensen 102a (Cp); Lourteig 894

[Herb. Inst. Miguel Lillo 113925] (Ca--166001), 925 (Ca--165696); Melis, Araque Molina, & Barkley 19Ar903 (N); Osten 5131 (N, Ug); Paci 514 (Au--122055, Go, N, St); Parodi 12807 (N); Ruiz Leal 961 (N), 3516 (N), 4063 (N), 6242 (N), 6382 (N), 6983 (N), 7308 (N), 7675/24 [Goodspeed 31024] (Z), 8413 (N, Ut--115421b), 9476 (N); Ruiz Leal & Paci 476 (N); Sanzin 898 [Herb. Osten 12806] (Ug); Semper 439 (N), 585 (S), s.n. [Ruiz Leal 4349] (N), s.n. [Ruiz Leal 9406] (N), s.n. [Ruiz Leal 10218] (N), s.n. [Ruiz Leal 10280] (N); Senn 4389 (Go, N, Vi, W--1995298). Neuquen: Fabris 806 (N, W--2144762). Río Negro: Eyerdam, Beetle, & Grondona 23541 (Ca--627530); W. Fischer 90 (Cm, Ur, W--704268); O'Donell 1844 (S); Scala 11 (N); Senn 4208 (N). San Juan: Cuezzo 2032 (N).

VERBENA CUMINGII Moldenke, Phytologia 2: 146--147. 1946.

Synonymy: Shuttleworthia cumingii Miers, in herb.

Bibliography: Moldenke, Phytologia 2: 146--147. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 55. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 197. 1949; Moldenke, Alph. List Cit. 4: 1215. 1949; Moldenke, Phytologia 3: 290. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 121 & 471. 1959; Moldenke, Résumé Suppl. 3: 14. 1962.

Herb; stems apparently procumbent, ascending at the tips, stramineous, tetragonal, hirsute with long, white, spreading or reflexed hairs; principal internodes 2--3.5 cm. long; nodes annulate, densely hirsute; leaves decussate-opposite, usually with an abbreviated branch in each axil, the branch very leafy and very hirsute; petioles about 5 mm. long or slightly longer, broadly winged and indistinguishable from the lamina; leaf-blades thin-chartaceous, uniformly green on both surfaces, deeply dissected or bipinnatifid, to 4 cm. long, strigose on both surfaces, the lobes subacute at the apex, the margins slightly revolute; midrib and secondaries very slender, obscure above, prominulous beneath; inflorescence solitary at the end of each stem; peduncles erect, elongate, 15--17 cm. long, rather more sparsely hirsutulous than the stems but similar in color and texture, terminated by a pair of opposite flowers with their subtending bractlets and, about 1 cm. beyond them, a dense head of flowers; bractlets lanceolate, 8--9 mm. long, about 1 mm. wide at the base, long-attenuate at the apex, hirsute-ciliate along the lower margins and short-strigillose on the back and toward the apex on the margins; calyx tubular, 10--11 mm. long (including the teeth), strigose with appressed whitish hairs of several lengths, its rim irregularly 5-toothed, the teeth long-attenuate, 1--2 mm. long; corolla large, showy, its tube projecting 2--3 mm. from the calyx, smooth on the outer surface, the limb about 12 mm. wide, the lobes deeply bilobed at the apex; anther-appendages large, black, conspicuously exserted.

The type of this species was collected by Hugh Cuming (no. 908) -- in whose honor it is named -- near Coquimbo, Coquimbo, Chile, sent to the Martius herbarium in 1835, and deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. The species has been collected in anthesis in September. Barros Valenzuela says that the flowers are "coffee-colored", but just what he means by this is not certain. The species appears to be very closely related to *V. paulseni* R. A. Phil. and may even prove to be conspecific with it.

In all, 6 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: CHILE: Coquimbo: *Barros Valenzuela 1374* (N), *8038* (N); *Cuming 908* (Bm--isotype, Br--type, N--isotype, N--photo of type, Z--photo of type). Santiago: *Claude-Joseph 1809* (W--1121335).

VERBENA CUNEIFOLIA Ruíz & Pav., Fl. Peruv. & Chil. 1: 22, pl. 32a. 1798 [not *V. cuneifolia* Hort., 1960, nor Raf., 1808, nor Wallberg, 1959].

Synonymy: *Verbena cuneiformis* Ruíz & Pav. ex Poir. in Lam., Encycl. Méth. Bot. 8: 546. 1808. *Verbena tetrandra, foliis trifidis; laciniis incisis; spicis ternis, oblongis* Ruíz & Pav. ex Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena cuneiformis* Spreng. ex J. Sm. in Rees, Cycl. 36: no. 25. 1817. *Verbena cuneifolius* R. & P. ex F. L. Herrera, Sinop. Fl. Cuzco 1: 352, sphalm. 1941.

Bibliography: Ruíz & Pav., Fl. Peruv. & Chil. 1: 22, pl. 32a. 1798; Raf., Med. Repos. N. Y., ser. 2, 5: 360. 1808; Poir. in Lam., Encycl. Méth. Bot. 8: 546. 1808; J. Sm. in Rees, Cycl. 36, no. 25. 1817; Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825; Walp., Repert. Syst. Bot. 4: 31. 1845; Schau. in A. DC., Prodr. 11: 539. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 23. 1849; Sanzin, Anal. Soc. Cient. Argent. 88: 98, 113, 114, & 134. 1919; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Prelim. Alph. List Invalid Names 45. 1940; F. L. Herrera, Sinop. Fl. Cuzco 1: 352. 1941; Moldenke, Alph. List Invalid Names 46. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35, 42, & 101. 1942; Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 243. 1943; Moldenke, Alph. List Cit. 1: 163 (1946) and 3: 687. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 101, & 197. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Phytologia 4: 267. 1953; Moldenke, Résumé 84, 121, & 471. 1959; Moldenke, Résumé Suppl. 2: 11 (1960) and 3: 13, 37, & 41. 1962.

Illustrations: Ruíz & Pav., Fl. Peruv. & Chil. 1: pl. 32a. 1798.

Perennial herb, 0.6--3 m. tall, woody below; stems erect, tetragonal, branched from the base or subsimple and corymbose above, hispidulous; leaves decussate-opposite, coriaceous, sessile or subsessile, broadly ovate or cuneiform in outline, 4--5 cm. long and wide, cuneate-coarctate or semi-amplexicaul at the base, deeply trifid, strigose-hispid on both surfaces, the segments lanceolate, incised-dentate or incised-pinnatifid, coarsely serrate, acute at the apex; spikes terminal, simple or subternate, about 2.5 cm. long, short-pedunculate or subsessile, oblong and compact, finally cylindric, subcanescent, strigose-hispid and glandulose; peduncles about 2.5 cm. long; bractlets lanceolate, about one-third as long as the calyx, subulate at the apex; flowers very decorative, fragrant; calyx about 8 mm. long, canescent-hispid, the rim 5-fid, the lobes acute or subulate; corolla varying from blue, deep-blue, dark-blue, or purplish-blue to violet, purple, bright-purple, or rich-purple, usually pale in the throat, its tube cylindric-subinfundibular, somewhat longer than the calyx, the uppermost third above the calyx pubescent, the limb medium-sized, deeply 5-fid; fruiting-calyx constricted above, twice as long as the fruit; cocci reticulate-tuberculate above.

This species has been collected in thickets, along roadsides, in sandy places, in deep soil of canyons, and among shrubby growth in fertile black soil, at altitudes of 3200 to 3600 meters, flowering in January, March to June, September, and November, and fruiting in May. Soukup says that it is locally common in Junín, Peru. Gay (1849) says that it occurs "en las cordilleras de Chile entre Santiago y Mendoza". Common names recorded for it are "cara huanzuy", "China-verbena", "verveine cunéiforme", and "wedge-leaved vervain".

Walpers (1845) classifies it in his Section *Verbenaca*, Subsection *Inermes*, Group *Foliosae*, Subgroup *Macranthae*, and Secondary Subgroup *Aubletia*, with ten other species. Schauer (1847) places it in Section *Verbenaca*, Subsection *Pachystachyae*, with 21 other species.

Schauer cites *Dombey 261* and *Ruíz & Pavon s.n.* from Huánuco and from Mayubamba, Peru, in the Berlin and De Candolle herbaria, the latter being the type collection of the species. Herrera (1941) cites his *no. 1409* from Cuzco, Peru. Raimondi (1943) cites his *no. 10255* from Huancavelica, *1535* & *12032* from Ancash, *2558* from Junín, and *8929* from Department undetermined, Peru.

It is worth noting that the *V. cuneifolia* of Rafinesque is *V. stricta* Vent., that of Wallberg is *V. simplex* Lehm., and that of Hort. is *V. hispida* Ruíz & Pav.

The *H. H. Rusby 911*, distributed as *V. cuneifolia*, is the type collection of *V. bangiana* Moldenke; *Cook & Gilbert 99* is *V. hayekii* Moldenke; *F. W. Pennell 14582* and *Wilkes s.n.* [Obrajillo] are *V. hispida* Ruíz & Pav.; and *Cook & Gilbert 373* is *V. parvula* Hayek.

In all, 12 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: PERU: Ayacucho: *Killip & Smith 23294* (N, W—1358017). Junín: *Killip & Smith 22124* (N, W—1357172); *Kunkel 383* (Gg); *Macbride & Featherstone 1210* (W—1474583); *Soukup 3537*

(Gg--353772, N, W--1930168); *Stork* *10920* (Ca--655732). La Libertad: *A. Lopez Miranda* *310* (N, Z). Department undetermined: *Dombey s.n.* [Macbride photos 17411] (Kr--photo, N--photo).

VERBENA CURTISII Moldenke, Phytologia 2: 147--148. 1946.

Synonymy: *Verbena caroliana* L. ex Moldenke, Phytologia 2: 148, in syn. 1946.

Bibliography: Moldenke, Phytologia 2: 147--148. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 55. 1948; Moldenke, Alph. List Cit. 4: 1216. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 7 & 197. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Phytologia 3: 467. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 10, 223, 361, & 471. 1959.

Herb; stems tetragonal, stramineous, lightly strigillose; nodes annulate, with a transverse band of short white hairs; leaves decussate-opposite, only the upper ones in and just below the inflorescence seen; petioles slender, 1--10 mm. long, sparsely scattered-pilose with short white hairs; leaf-blades thin-chartaceous, light-green, lanceolate, 1.5--4 cm. long, 7--20 mm. wide, acute or subacute at the apex, attenuate into the petiole at the base, rather regularly serrate from the widest part to the apex with blunt or acute broadly triangular forward-pointing teeth, scattered-strigillose on both surfaces with short appressed whitish hairs, more densely so along the venation beneath; inflorescence abundant; spikes slender, numerous, two from each upper node, three at the apex of each branch, 4--15 cm. long, rather densely flowered and fruited, often branched toward the base, the branches subtended by reduced leaves; peduncles slender, usually abbreviated to about 1 cm., lightly strigillose; bractlets lanceolate, about 2 mm. long, long-attenuate at the apex, ciliate-margined, otherwise glabrous, persistent after the fruit and fruiting-calyx have fallen; corolla very small, the tube about 2 mm. long, the limb slightly exserted; fruiting-calyx about 2 mm. long, strigillose, especially toward the apex, the teeth coming together over the apex of the fruit and forming a distinctly sharp point until the calyx is ruptured; fruit about 1 mm. long, smooth, long-coherent.

The type of this very puzzling species was collected by Moses Ashley Curtis -- in whose honor it is named -- somewhere in "Carolina" [probably North Carolina] and is labeled "*Verbena caroliana* L." It is Herb. G. Geete no. 5702, now deposited in the herbarium of the Botaniska Trädgard at Göteborg, Sweden. The species reminds one of *V. carolina* L. in its general aspect, but differs markedly in its minute pubescence. It also resembles *V. urticifolia* L., but its fruiting-calyxes are more like those of *V. scabra* Vahl, from which its non-scabrous leaves at once distinguish it. It differs from *V. riparia* Raf. and *V. urticifolia* in its dense fruiting-spikes and from the former in its non-lobed leaves. Its full fruiting-calyxes seem to preclude x*V. engelmannii* Moldenke or any other hybrid origin. A common name recorded for it is "hierba de la mula".

In all, 3 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: NORTH CAROLINA: County undetermined: *M. A. Curtis s.n.* [e Carolina] (Go—type, N—photo of type, Z—photo of type). CULTIVATED: Belgium: *M. Martens s.n.* [h. b. lov. 1845] (Br, N).

xVERBENA DEAMII Moldenke, Revist. Sudam. Bot. 4: 18. 1937.

Synonymy: *Verbena bracteata* x *stricta* Palmer, Ann. Mo. Bot. Gard. 22: 629. 1935 [not *V. bracteata* x *stricta* Schneck, 1941]. *Verbena stricta* x *bracteosa* Bebb ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937 [not *V. stricta* x *bracteosa* Engberg, 1958, nor A. S. Hitchc., 1940]. *Verbena stricta* x *bracteosa* Eggert ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. *Verbena stricta* x *bracteosa* Mackenzie ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. *Verbena stricta* x *bracteosa* Rydb. ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. *Verbena bracteata* x *stricta* Gates, Fl. Kans. 190. 1940. *Verbena stricta* x *bracteosa* Sandberg ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. *Verbena stricto-bracteosa* Patterson ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947 [not *V. stricto-bracteosa* Engelm., 1940]. *Verbena stricta* x *bracteosa* Waite ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962. *Verbena stricta-bracteosa* Michx. ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962. *Verbena bractiosa* x *stricta* Holzinger ex Moldenke, Résumé Suppl. 3: 36, in syn. 1962.

Bibliography: E. J. Palmer, Ann. Mo. Bot. Gard. 22: 629. 1935; Moldenke, Revist. Sudam. Bot. 4: 18. 1937; Gates, Fl. Kans. 190, map 1072a. 1940; Moldenke, Prelim. Alph. List Invalid Names 45. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 6—9, 11, & 101. 1942; Moldenke, Alph. List Invalid Names 50. 1942; Moldenke, Castanea 10: 38. 1945; Moldenke, Alph. List Cit. 1: 40 & 181. 1946; Moldenke, Phytologia 2: 327. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 27. 1947; Moldenke, Alph. List Cit. 2: 518 & 522 (1948), 3: 699, 708, 773, 800, 887, 892, & 912 (1949), and 4: 1098, 1229, 1255, & 1261. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 12, 13, 15—17, 20, & 197. 1949; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 127, 131, & 134 (1952) and pr. 2, 3: 127, 131, & 134. 1958; Moldenke, Am. Midl. Nat. 59: 345. 1958; Moldenke, Résumé 16, 17, 19, 21, 22, 25, 359, 375, & 471. 1959; Moldenke, Résumé Suppl. 3: 5, 6, 36, & 41 (1962) and 4: 3. 1962.

Illustrations: Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 134 (1952) and pr. 2, 3: 134. 1958.

This name has been proposed for the natural hybrid between *V. bracteata* Lag. & Rodr. and *V. stricta* Vent., commonly found where the ranges of these two species overlap in the central United

States. The hybrid resembles *V. bracteata* in habit, but is stouter, with broad, laciniate, strongly reticulate leaves, larger flowers, smaller usually not foliaceous bractlets which are mostly about 5 mm. long and are long-attenuate or long-acuminate at the apex, the spikes usually only 6--10 mm. wide and poorly fruited, and the pubescence in the inflorescence only softly villous.

Collectors have found this plant in copses and on sandy plains, describe it as "decumbent", "procumbent", "ascending", or "erect", and have collected it in flower and fruit from June to August.

The type of the hybrid was collected by Per Axel Rydberg at Kearney, Buffalo County, Nebraska, on June 20, 1895, and is deposited in the Britton Herbarium at the New York Botanical Garden. The name, *V. stricta* x *bracteosa* Waite is based on *Waite s.n.* from Mount Carmel, Wabash County, Illinois, collected on August 6, 1887, and deposited in the herbarium of the University of Illinois; *V. bracteata* x *stricta* Gates is based on *J. B. S. Norton s.n.* from Manhattan, Riley County, Kansas, collected in August, 1892, and deposited in the herbarium of Kansas State College; *V. stricta* x *bracteosa* Sandberg is based on *Sandberg s.n.* from Hennepin County, Minnesota, collected in August, 1881, and deposited in the herbarium of the New York State Museum at Albany; *V. stricta* x *bracteosa* Eggert is based on *Eggert s.n.* from Saint Louis, Missouri, collected in August, 1886, and deposited in the herbarium of the New York State Museum at Albany; and *V. stricto-bracteosa* Patterson is based on *H. N. Patterson s.n.* from Henderson County, Illinois, collected in July, 1872, and deposited in the herbarium of the New York State Museum at Albany.

The hybrid is recorded from Jasper County, Missouri, by Palmer (1935) and from McPherson County, Kansas, by Gates (1940). Herbarium specimens have been misidentified and distributed in herbaria under the names *V. bracteata* Lag. & Rodr., *V. stricta* Vent., *V. bracteosa* x *stricta* Eggert, and *V. bracteoso-stricta* Engelm.; Sheldon calls it "*V. bracteata* x *hastata*", which it certainly is not.

The so-called *V. bracteata* x *stricta* of Schneck is x*V. perriana* Moldenke; the *V. bracteosa* x *stricta* of Britton, of Palmer, and of Schneck are also x*V. perriana*; the *V. bracteosa* x *stricta* of Deam, of Eggert, and of Rydberg are x*V. rydbergii* Moldenke; and the *V. stricta* x *bracteosa* of Hitchcock is x*V. perriana*, while that of Engberg is typical *V. bracteata* Lag. & Rodr. The *V. stricto-bracteosa* of Engelmann is x*V. perriana*.

Wallis describes the plant as "somewhat ascending. The *H. R. Bennett s.n.* [Brewster Arnold Ranch, August 2, 1957] in the United States National Herbarium bears a note "evidently a hybrid with *V. stricta* Vent. or some other species", but I regard this specimen is representing typical *V. bracteata*.

ARACHNIODES, A FERN GENUS UNRECOGNIZED FROM HAWAII

Otto & Isa Degener

Thanks to the lucid article by M. D. Tindale in Contr. New South Wales Nat. Herb. 3 (2): 89--90. 1961, we find the genus Arachniodes Blume (Enum. Pl. Jav. 241. 1828) to be represented in the Hawaiian Islands by a form of what has been hitherto known locally as Dryopteris (Polystichopsis) carvifolia (Kuntze) C. Christensen, Bull. B. P. Bishop Mus. 25: 10. 1925. We herewith place this species in its proper genus as Arachniodes carvifolia (Kuntze) Deg. & Deg., comb. nov.

BOOK REVIEWS

Alma L. Moldenke

"Plant Life of Palestine Israel and Jordan", by Michael Zohary; vi and 262 pp., illustr. Ronald Press, New York City, 1962. $8.00

This new member of the worthy Chronica Botanica New Series of Plant Science Books presents readably the dedicated study over a few score years of the taxonomy, geography, ecology, physiology and economic importance of the native wild, the introduced wild and the cultivated plants of the area. The author is fortunate to have additionally a backlog of nearly two centuries of plant collections from this Palestinian area, the assistance of an able crew of fellow scientists and a public — locally and abroad — very much interested in these studies.

The text is organized ecologically. The nomenclature employed is not one of the many still-forming American systems, but that of the Zürich-Montpellier School led by Braun-Blanquet. Much simplified, the plant habitats are semi-humid, semi-arid and arid. The rainfall varies annually from 1,000 mm. in the north down to 25 mm. in the south, with about 75 percent of the precipitation felt in December, January and February.

Data is presented so effectively that one can easily envision the plant growth as the following items indicate: There are 718 genera with 2250 species recorded, with the bulk of the plant cover composed of ten percent of the species. There is no alpine or subalpine flora. The greatest numbers of species are from the following families in descending order: Compositae, Gramineae, Leguminosae, Umbelliferae and Cruciferae. The genera represented by the greatest number of species are Astragalus with 44, Trifolium with 40, Silene with 36, Euphorbia with 31 and Allium with 25. Weeds comprise 450 species; endemics total 160 species; annuals make up 50 percent of the flora.

The very clearly reproduced photographs and line drawings of many of the important plants and typical scenes as well as the clarity of the text show some of the dynamic effects of time, earth forces and man from the Tertiary to the Natufian culture of 8000 B.C. and on to the present day on this area. Personally (as co-author with my husband on "Plants of the Bible", Ronald Press, New York City. 1952) I wish that there was more mention of the plant life of Bible times but such was not the intention of the author. What plants now throughout this area have been introduced since Old and New Testament days? What ones from then have been eliminated, altered, decreased or increased?

The chapter on "Man and Vegetation" gives potent reasons for conservation. The descriptions of desert and steppe plant life are some of the best ever printed.

After reading this excellent book I am all the more eager to visit and study this area.

"Atlas of Plant Morphology Portfolio II: Photomicrographs of flower, fruit and seed", by Emma L. Fisk and W. F. Millington; 48 pp. Burgess Publishing Co., Minneapolis 15, Minnesota. 1962. $2.75

Fine camera reproductions of well prepared slides of flower, fruit and seed sections — often with a couple of illustrations per page — make this looseleaf portfolio very attractive and useful.

Each picture page lists family, genus, species and common names. Text descriptive of the morphological features is on separate pages. Because of the looseleaf arrangement, the individual sheets can be put to many different uses by teachers, students and professional botanists in lectures, quizzes and laboratory exercises in several courses on college campuses and even for high school biology. Students could use them advantageously in conjunction with their own slide making or with their tissue drawings. Students certainly should be trained "to tell the truth, the whole truth, and nothing but the truth" with their 4H pencils and/or stippling pens. An accurate drawing of a small segment of a slide should suffice, particularly if augmented by these inexpensive photomicrographs.

Now I am eager to peruse Portfolio I on roots, stems and leaves.

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NOTES ON EASTERN AMERICAN SPECIES OF PENSTEMON

Ralph W. Bennett *

The forthcoming publication of a taxonomic booklet on the eastern American species of Penstemon suggests the desirability of a few taxonomic and nomenclatural changes being published now. Most of these changes are in accord with ideas expressed to me by Dr. David D. Keck in a recent informal conversation.

Following the recommendation in Article 22 of the 1961 International Code of Botanical Nomenclature, the following changes in names of subdivisions of the genus Penstemon are published:

Subgenus Eupenstemon is changed to Subgenus Penstemon, Section Spermunculus to Section Penstemon, and Subsection Graciles to Subsection Penstemon. The three names Eupenstemon, Spermunculus, and Graciles were used by Dr. Keck in his Studies in Penstemon VIII, American Midland Naturalist Vol. 22, No. 1: 128-206. 1945.

P. laevigatus Solander, P. digitalis Nutt., P. calycosus Small, P. alluviorum Pennell, and P. deamii Pennell are combined into one species, as follows:

P. laevigatus Solander.

- ssp. laevigatus
  - P. laevigatus Solander, Ait., Hort. Kew. 2: 361. 1789.
- ssp. digitalis (Nutt.) Bennett. comb. nov.
  - P. digitalis Nutt., Sims in Bot. Mag. 52: pl. 2587. 1825.
- ssp. calycosus (Small) Bennett. comb. nov.
  - P. calycosus Small, Bull. Torrey Bot. Club 25: 470. 1898
- ssp. alluviorum (Pennell) Bennett. comb. nov.
  - P. alluviorum Pennell, Small, Man. S.E. Fl. 1203. 1933.
- ssp. alluviorum var. deamii (Pennell) Bennett. comb. nov.
  - P. deamii Pennell, Monograph No. 1, Acad. Nat. Sci. Phila. 212. 1935.

P. pallidus Small, P. arkansanus Pennell, and P. multicaulis Pennell are combined into one species, as follows:

P. pallidus Small

- ssp. pallidus
  - P. pallidus Small, Fl. S.E. Un. St. 1060, 1337. 1903.
- ssp. arkansanus (Pennell) Bennett. comb. nov.
  - P. arkansanus Pennell, Proc. Acad. Nat. Sci. Phila. 73: 494. 1922.
  - P. multicaulis Pennell, in Proc. Acad. Nat. Sci. Phila. 73: 494. 1922.

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P. australis Small, P. laxiflorus Pennell, and P. wherryi Pennell are combined into one species, as follows:

P. australis Small

ssp. australis
P. australis Small, Fl. S.E. Un. St. 1060,1337. 1903.

✓ *ssp. laxiflorus* (Pennell) Bennett. comb. nov.
P. laxiflorus Pennell, Monograph No. 1, Acad. Nat. Sci. Phila. 229. 1935.
P. wherryi Pennell, Monograph No. 1, Acad. Nat. Sci. Phila. 228. 1935.

P. wisconsinensis Pennell is reduced to a variety of *P. gracilis* Nutt., as follows:

P. gracilis Nutt.

✓ *var. gracilis*
P. gracilis Nutt., Gen. N. Amer. Pl. 2: 52. 1818.

✓ *var. wisconsinensis* (Pennell) Bennett. comb. nov.
P. wisconsinensis Pennell, Monograph No. 1, Acad. Nat. Sci. Phila., 234. 1935.

The following new varieties are published:

P. laevigatus Solander *ssp. digitalis* (Nutt.) Bennett

var. angustus Bennett, var. nov.

A subsp. *digitali* caulibus dimidio minoribus (ca. 40 cm. longis) et folius multo minoribus et angustioribus (ca. 2 cm. latis) differt.

P. hirsutus Willdenow

var. hirsutus
P. hirsutus (L.) Willd., cur. L., Spec. Plant. ed. IV. 3: 227. 1800.

✓ *var. pygmaeus* Bennett, var. nov.

A var. *hirsuti* caulibus decumbentibus differt.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS *VERBENA*. X

Harold N. Moldenke

xVERBENA DEAMII Moldenke

In all, 33 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: ILLINOIS: Coles Co.: *Ahles & Gilpin 7455* (Hi--103233). Henderson Co.: *H. N. Patterson s.n.* [July 1872] (Al), *s.n.*[near Oquawka, July 17, 1873] (Dt), *s.n.* [Oquawka, July] (W--491614), *s.n.* [vicinity of Oquawka] (N, Ur, W--1323063, W--1323123). Wabash Co.: *Waite s.n.* [Mt. Carmel, Aug. 6, 1887] (Ur). IOWA: Story Co.: *C. E. Bessey s.n.* [Ames, Aug. 23, 1878] (Ua--11374). WISCONSIN: Pierce Co.: *Schuette s.n.* [Bay Settlement, July 19, '83] (Du--122875). MINNESOTA: Hennepin Co.: *J. H. Sandberg s.n.* [Aug. 1889] (Al, Ca--25174, Up--17089, W--71937). Winona Co.: *Holzinger s.n.* [Winona, July 10, 1888] (Ca--67416). KANSAS: Riley Co.: *J. B. S. Norton s.n.* [Manhattan, Aug. 1892] (Ka). Wyandotte Co.: *K. K. Mackenzie s.n.* [Aug. 16, 1896] (N). NEBRASKA: Buffalo Co.: *Rydberg s.n.* [Kearney, June 20, '95] (N--type), *s.n.* [Kearney, June 1895] (N). Lancaster Co.: *J. L. Sheldon s.n.* [June 24, 1899] (We). Nemaha Co.: *J. L. Sheldon s.n.* [Peru, June 20, 1900] (We). MISSOURI: Greene Co.: *Eggert s.n.* [Brooklin, 13 July 1879] (Cm, N, W--754199). St. Louis: *Eggert 5321* (N), *s.n.* [Aug. 1886] (Al); *Engelmann s.n.* [St. Louis, Aug. 1843] (Pr), *s.n.* [St. Louis, July 1861] (Dt), *s.n.* [St. Louis, Aug. 1861] (Dt), *s.n.* [St. Louis, 1861] (Br); *M. Martens s.n.* (Br). OKLAHOMA: Adair Co.: *C. S. Wallis 2385* (St).

VERBENA DELICATULA Mart. ex Zucc. in Otto & Dietr., Allg. Gartenzeit. 2: 243 & 245. 1834.

Synonymy: *Verbena delicatula* Mart. & Zucc. apud Schau. in A. DC., Prodr. 11: 555. 1847.

Bibliography: Zucc. in Otto & Dietr., Allg. Gartenzeit. 2: 243 & 245. 1834; Schau. in A. DC., Prodr. 11: 555. 1847; Jacks., Ind. Kew. 2: 1178. 1895; Perry, Ann. Mo. Bot. Gard. 20: 342 & 355. 1933; Moldenke, Résumé Suppl. 2: 4, 11, & 15. 1960.

Softly pubescent throughout; stems short, erect; leaves petiolate, broadly cordate-ovate, coarsely serrate, subinequilateral at the base; racemes rather slender; flowers erect; calyx 5-angled, long, the rim 5-dentate; corolla-tube narrow, curvate, the limb rose-colored, the lobes rounded, the upper one smaller.

The type of this virtually unknown species was collected by Freiherr Wilhelm Friedrich von Karwinski von Karwin at Tehuantepec, Oaxaca, Mexico, in moderately warm places. Perry (1933) says "Unfortunately the essential characters, which would separate this species from its allies, are not clearly defined. The description is so much like that of V. barbata that the writer suspects that the two species are identical."

VERBENA DELTICOLA Small ex Perry, Ann. Mo. Bot. Gard. 20: 314—315. 1933.

Synonymy: Verbena denticola Small ex Cory, Texas Agr. Exp. Sta. Bull. 550: 88, sphalm. 1937.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 248, 311, 314—315, & 355. 1933; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Hill, Ind. Kew. Suppl. 9: 294. 1938; Moldenke, Suppl. List Invalid Names 8. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13, 18, & 101. 1942; Moldenke, Alph. List Invalid Names 46. 1942; H. S. Gentry, Carnegie Inst. Wash. Publ. 527: 221 & 306. 1942; A. M. T. Davis, Study Boscaje Palma 61. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 17, 18, & 35—36. 1942; Moldenke, Phytologia 2: 75, 79, 114, & 128. 1945; Moldenke, Alph. List Cit. 1: 2, 13, 17, 32, 111, 126, 176, 215, 216, 232, & 274 (1946) and 2: 370, 483, 593, & 639. 1948; Moldenke, Wrightia 1: 230. 1948; Moldenke, Phytologia 2: 162. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 23, 32, & 197. 1949; Moldenke, Alph. List Cit. 3: 656, 678, 681, 697, 752, 766, 784, 785, 795—797, 807, 829, 831, 878, 881—883, & 933 (1949) and 4: 990, 1071, 1072, 1075, 1081, 1095, 1111, 1126, 1170, 1171, 1218, 1230, 1240, 1246, & 1290. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Résumé 29, 39, 363, & 471. 1959; Lewis & Oliver, Am. Journ. Bot. 48: 639—641. 1961; Moldenke, Résume Suppl. 3: 7 & 10. 1962.

Illustrations: Lewis & Oliver, Am. Journ. Bot. 48: 640. 1961.

Annual or sprawling perennial herb, to 30 cm. tall; stems decumbent or ascending to erect, branched, more or less hirsute; roots fibrous; bark green; leaves ovate-deltoid, 3—7 cm. long, with a truncate or truncate-cuneate base narrowed into a margined petiole, obtusish or subacute at the apex, coarsely serrate-dentate, often 3-lobed, usually thin-textured, sparsely appressed-hirsute on both surfaces, the hairs often with minute bulbous bases on the upper surface; spikes pedunculate, fascicle-like during anthesis, becoming elongate in fruit; bractlets linear-attenuate, shorter than or equaling the calyx; flowers showy, odorless or fragrant with a faint odor; calyx 7—8 mm. long, sparsely glandular, hirsute, its lobes slender, subulate, unequal; corolla showy, varying from red or almost red, pink, rose, rose-pink, deep-pink, bright magenta-pink, pink-red, pink-purple, bright pink-purple, rose-purple, or red-purple to purplish, purple, deep-purple, violet-purple, deep pinkish-lavender, lavender-blue, light-violet, or violet, sometimes pink-lavender with a whitish "eye" or "fuchsia-color", its tube 1—1.5 cm. long, protruding well beyond the calyx, pubescent or glabrate on the outside, the limb 7—10 mm. wide, the lobes emarginate; cocci about 3 mm. long, subcylindric, reticulate from the apex to the definitely broadened base, the commissural faces practically reaching the tip of the cocci, muricately scabrous; chromosome number: n = 15.

The type of this species was collected by Roxana Judkins Ferris and Carl Dudley Duncan (no. 3161) at Las Palmas Ranch, in the vicinity of Brownsville, Cameron County, Texas, between August 1 and 5, 1921, and is deposited in the Britton Herbarium at the New York Botanical Garden. In southern Texas the species is said to grow in sandy soil, clay, loam, or sandy clay loam, in open grounds, fields, or orchards, or at the edge of thickets, often covering acres of ground, blooming from February to August on the Rio Grande plains from Maverick to Cameron Counties. Runyon says that his "original" collection of this species was no. 630, not as yet seen by me, and that the species is frequent to abundant in early spring "throughout this region" and "throughout Cameron County", forming large colonies, covering small or large areas. He says that it is "abundant throughout the [Rio Grande] valley" in that county. Clover reports that in Hidalgo County it "covers acres of ground". Gentry asserts that it is only "casual and scattered on milpas in the Lower Sonoran zone" in Sonora. Leavenworth found it on limestone bedrock covered in spots with tufa in Nuevo León, where Mueller reports it as "rare on sand bars at edge of rivers" and Thompson found it "in red sandy clay soil on rocky mountainside in dense oak-pine woods" and Weaver found it in "loose sandy soil near rivers". Buchholz, however, says "common in region" [Nuevo León].

Collectors have found it in sand, sandy loam, sticky black soil, limestone soil, clay soil, and alluvial soil, growing on rocky hillsides, gravelly slopes, basaltic hills, road-cuts, and unwooded sandy hillsides, near brooks and ponds, in limestone canyons, pine woodlands, clearings, open grounds and fields, orange orchards, open valleys, roadside ditches, open low pastures, arroyos, and thorn forests on volcanic cerro slopes, at the edge of thickets, among grass, and along roadsides, at altitudes of 10 to 2000 meters. It has been collected in anthesis and fruit in every month of the year. Gentry asserts that the species in Sonora inhabits sandy adobe soils in valley margins of the Short-tree Forest area in the foothills. Johnston found it in "openings in dense brush on tight clay" and with Davis in "clearings in dense brush on fine tight clay along arroyos".

It is mentioned by Anna May Tarrence Davis in her thesis "A study of Boscaje de la Palma in Cameron County, Texas, and of Sabal texana" (August 1942). Common names recorded for it are "alfombrilla", "bartunicha", "kamiyo", and "moradia".

Specimens have been misidentified and distributed in herbaria under the names V. ambrosifolia Rydb., V. aubletia Jacq., V. aubletia L., V. bipinnatifida Nutt., V. canadensis Britton, V. ciliata Benth., "V. sp. aff. V. ciliata", V. ciliata var. longidentata Perry, V. elegans H.B.K., V. elegans var. asperata Perry, V. gooddingii Briq., V. gooddingii nepetifolia Tidestr., V.

gooddingii var. nepetifolia Tidestr., V. lambertii Sims, V. pumila Rydb., and V. quadrangulata Heller.

On the other hand, the R. M. King 3983, Liebmann 11313 & 11314, Nealley 117, Edw. Palmer 90, R. Runyon 1943, and J. N. Weaver 667 annotated as V. delticola by Perry and cited by her or so identified and distributed, are all V. cameronensis L. I. Davis; G. L. Fisher 45198 is V. elegans var. asperata Perry; and J. N. Weaver 1033 is V. pumila Rydb. The Edw. Palmer 1045 annotated by Perry as "Aff. V. delticola Small" is V. quadrangulata Heller and the Edw. Palmer 34, similarly annotated, is V. andrieuxii Schau.

The E. W. Nelson 6028 and Edw. Palmer 39 in the Britton Herbarium are anomalous in appearance and may actually not belong here. Frye & Frye 2310 has much the aspect of V. gooddingii var. nepetifolia.

L. Irby Davis, in a letter to me dated July 28, 1941, says "I am at present interested in studying the variations in V. delticola Small. There are certain features in specimens from the type locality (some of which can be observed usually only in fresh material) which I find are not present in specimens called V. delticola from E. San Luis Potosí and S. Tamaulipas. Also I feel sure that there are at least two species in San Luis Potosí that are usually identified as V. delticola. There are seasonal, calendar and habitat variations in V. delticola in my home county which make it easy to study the species."

The Ecology Class Univ. Texas s.n. cited in Lundell, Fl. Texas 3 (1): 36 (1942) as V. delticola is actually V. cameronensis L. I. Davis. Similarly, the Nealley 117 and 118 and Edw. Palmer 90 [insofar as seen by me], cited by Perry (1934) as V. delticola, are actually V. cameronensis.

Miss Perry cites the following 15 additional specimens not as yet examined by me: TEXAS: Cameron Co.: Ferris & Duncan 3161 (E--isotype). MEXICO: Nuevo León: Arsène 6129 (E, G); Gregg 202 (E), 752 (E); Edw. Palmer 1051 (G); Pringle 2228 (G), 11843 (G). Tamaulipas: E. W. Nelson 4424 (G), 6628 (E, G); Edw. Palmer 39 (E, F, G). Vera Cruz: Ervendberg 236 (G). She says "Superficially, this species bears a strong resemblance to V. canadensis, but usually the leaves are not so deeply incised. Its distinctive character is found in the nutlet. Commonly, in the section Glandularia, the schizocarp is shallowly lobed at the apex; hence, the style appears to be attached in a very definite depression and ordinarily the commissural face does not reach the tip of the nutlet. In V. delticola, however, the depression is indefinite, the commissural face practically reaches the tip, and the separate nutlets viewed from the lateral or ventral surface suggest a tendency toward developing a beak. In Safford 1221 a small beak is present." The Liebmann 11313 & 11314, Nealley 117, and Edw. Palmer 90 which she cites are V. cameronensis. She has annotated E. Stearns 104 as V. ambrosifolia Rydb., but I do not think that it belongs there. Instead, I am citing it as V. delticola -- its leaves do not look like those of V. delticola, but its flower spike does. Of Mearns 591 she says "Cf. Verbena ambrosifolia Rydb.", but, again, I doubt that it is that species. E. W. Nelson 6628 has two labels on the sheet which originally indicated its number as "6028".

In all, 129 herbarium specimens, including type material of all the names involved, and 1 mounted description have been examined by me.

Citations: TEXAS: Cameron Co.: Cory 28301 (N), 28302 (Ur); L. I. Davis s.n. [Olmito, Dec. '41] (Au--122061), s.n. [4 miles southeast of Rangerville, December 2, 1945] (Au--171995); Davis & Johnston 53253.21 (Au--122065); Ferris & Duncan 3161 (Du--125424--isotype, Gg--31467--isotype, N--type); H. C. Hanson 466 (W--982824); Hotchkiss 6184 (Ar--219537); M. C. Johnston 54150 (Au--122066, St, St); F. L. Lewton 141 (Ar--271586, W--56209); C. L. Lundell 10680 (N, Rf, Rf, W--1926930), 10758 [South. Appal. Bot. Club 17th Distrib. 1647] (Hi--148547, Hi--158540, N, N, Rf, Rf, Rf, We); Lundell & Lundell 10018 (Ld, N, W--1888877); H. B. Parks 2936 (Wi, Wi, Wi), 2937 [Cameron Co.] (Wi, Wi); Parks & Cory 17935 (Tr); R. Runyon 327 (Au--122062, Au, W--1222821), 1781 (Rr, Rr), 1943 (N, Rr), 2182 (Rr), 2363 (N, N, N, N, N, N, N), 2587 (N, N, N, N, N), 2693 (N, N), 3942 (N); I. Shiller 334 (W--1812047); Small & Wherry 11901 (N). Hidalgo Co.: L. H. Bailey 7431 (Ba); Clover 106 (Fs, Gg--233345), 566 (Fs, Me); L. H. Hooker 5999 (W--1468812); Lundell & Lundell 9802 (Ld, N), 9804 (Ld, N, W--1888831), 9828 (Ld, N), 9979 (N); Molby 7224 (W--1465434); H. B. Parks 2937 [Mission] (Wi); Tharp 5999 (Au--122063); Uzzell 69 (Au--122064, N). Maverick Co.: Parks & Cory 12422 (Tr). Willacy Co.: M. C. Johnston 53253.14 (Au--122024). MEXICO: Chihuahua: E. Stearns 104 (W--502848). Coahuila: E. G. Marsh 1184 (St), 1592 (St), 2147 (St). Nuevo León: Abbon 19 [Arsène 6129] (N, Ur, W--1003536); Arsène s.n. [Monterrey, 5-1911] (B, N); F. A. Barkley 14361 (Au); Barkley, Webster, & Rowell 7131 (Au--123274, N); J. T. Buchholz s.n. [Feb. 23, 1936] (Ur); L. I. Davis s.n. [Teran, March 4, 1959] (Au--171918); Herb. Inst. Biol. Univ. Nac. Mex. 7138, in part (Me); Johnson & Barkley 16129M (Au); W. C. Leavenworth 119 (Ur); Lewis & Oliver 5419 (Nb); C. H. Mueller 2058 (Mi); Mueller & Mueller 158 (Me); Oldendorf & Oldendorf s.n. [April 23, 1934] (Ok--16316); C. R. Orcutt 1191 (W--1207770); Edw. Palmer 1045 (W--1323077), 1051 (Pa, W--56180); F. W. Pennell 16844 (D--733978, Me, Me, W--

1640274); Pringle 2228 (Me), 11843 (Ca—168341, Gg—421278, Mi, Mi, St, Vt, W—462591, W—1586430); Rowell, Lind, & Barkley 16M584 (Au); Safford 1221 (W—573262); Tharp 1826 (W—1203121); W. M. Thompson 258 (Au—167418); J. N. Weaver 562 (W—2134143), 1033 (N); S. S. White 24 (Mi), 1539 (Mi), 1576 (Mi). Puebla: Goldman 42 (W—324807). San Luis Potosí: Graber 183 (W—2085422); Edw. Palmer 34 (N). Sonora: R. J. Ferris 8770 (W—1686987); Frye & Frye 2264 (W—1790984), 2310 (Du—285440, Rs—25552, W—1790989); H. S. Gentry 356m (Ak—20069, Mi), 1312 (Ak—19968, Ca-646402, Fs, Ge, I, Me, Me, Mi, N, N, S, S), 1313, in part (Ge), 7942 (Ak—22061); Shreve 6081 (Fs); S. S. White 708 (Mi), 774 (Mi), 3787 (Mi); Wiggins 6102 (Du—215932), 6288 (Ca—590450, Mi, W—1739922), 7225 (Mi). Tamaulipas: H. H. Bartlett 10127 (Mi), 10170 (Mi), 10985 (Mi), 11133 (Mi); LeSueur 400 (Au, Fs); Lewis & Oliver 5420 (Nb), 5421 (Nb); E. W. Nelson 4424 (W—330977), 6028 (N), 6628 (W—347257), s.n. [May 1898] (W—203186); Edw. Palmer 39 (Ca—145872, Cp, N, W—572267), 90, in part (Cb); Stanford, Lauber, & Taylor 2100 (Du—366279, N, N); Viereck 957 (W—1687466). Vera Cruz: MacDaniels 454 (Ba). State undetermined: Mearns 591 [San Bernardino ranch, Mex. bound. line] (W—591720); Née 79 (Q). MOUNTED DESCRIPTION (N).

VERBENA DELTICOLA f. LILACINA L. I. Davis in A. M. T. Davis, Study Boscaje Palma 62 [as "lilaciana"]. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2 & 4. 1943.

Bibliography: A. M. T. Davis, Study Boscaje Palma 62. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2 & 4. 1943; Moldenke, Phytologia 2: 128. 1945; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed.2], 23 & 197. 1949; Moldenke, Résumé 29, 363, & 471. 1959.

This form is said to differ from the typical form of the species in having lavender corollas.

The type of the form was collected by L. Irby Davis on the banks of Resaca del Rancho Viejo, Cameron County, Texas, in May, 1942, and is deposited in the herbarium of the University of Texas at Austin. In view of the great variability in the color of the corolla as reported by collectors for the typical form of the species, I strongly doubt the practicability of maintaining this form except for horticultural purposes if/when the species becomes a horticultural subject. It is possibly a similar case to the lilac "form" of V. cloverae Moldenke. Mr. Davis, however, says "there must be a thousand pink-flowering plants of V. delticola to one of the lavender form. It seems to be a mutation that is likely to happen anywhere though and once it occurs is likely to spread locally. Although this color form is sometimes found mixed up with masses of V. ciliata var. longidentata plants, it is just as likely to be found where there are no *V. ciliata* varieties for miles around."

It should be borne in mind that in many cases where a series of colors, tints, and shades is given in the description of the flowers of a species. these are taken from notes by collectors on their labels and may in part, at least, merely reflect the different color concepts of the collectors, some of whom may be partially or wholly color-blind. It is very possible that if a single person were to observe all the specimens in question at the time of their collection not nearly so many colors would be recorded. Therefore, the corolla-color may in many cases be far more uniform than these notes would indicate.

VERBENA DEMISSA Moldenke, Phytologia 3: 286, nom. nud. (1950) and 4: 183. 1953.

Bibliography: Moldenke, Phytologia 3: 286 (1950) and 4: 183. 1953; Moldenke, Biol. Abstr. 27: 1887. 1953; Moldenke, Mem. N. Y. Bot. Gard. 9: 177. 1955; G. Taylor, Ind. Kew. Suppl. 12: 149. 1959; Moldenke, Résumé 80 & 471. 1959.

Prostrate or sprawling perennial herb with heavy woody roots and many stems issuing from the crown; stems and branches numerous, slender, rather acutely tetragonal, decumbent or ascending, often closely appressed to the ground, minutely strigillose with tiny widely scattered hairs or glabrate; nodes annulate, often marked with a band of denser, whitish, spreading hairs; principal internodes much abbreviated, to 2 cm. long, usually much less; leaves decussate-opposite, subsessile or short-petiolate; petioles filiform, about 1 mm. long, white-pilose on the margins with sharp-pointed ascending hairs; leaf-blades chartaceous, rather uniformly dull-green on both surfaces, elliptic in outline, 5--14 mm. long, 2--7 mm. wide, incised-dentate from the widest part to the acute apex, cuneately narrowed to the base, more or less sparsely white-strigose above, white-pilose or substrigose along the venation and margins beneath; midrib and the 2 or 3 pairs of ascending secondaries usually subimpressed above and prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, spicate, elongate, loosely many-flowered, 2--10.5 cm. long, erect; peduncles filiform, 5--7 mm. long, glabrate or very minutely scattered-pilosulous; rachis filiform, glabrous or very minutely and obscurely scattered-pilosulous; flowers imbricate during anthesis only; calyx cylindric, about 2 mm. long, strigillose on the ribs; corolla very small, deep-blue to light- or pale-blue, pale-lavender, or almost white, hypocrateriform, its narrow-cylindric tube about 2 mm. long, the limb 1--1.5 mm. wide; fruiting-calyx somewhat divergent, not imbricate, not enlarged, minutely strigillose; cocci 4, about 1.8 mm. long.

The type of this species was collected by Wendell Holmes Camp (no. E.2510) in the Parroquia Luis Cordero near the village of San Marcos, 5--8 km. northeast of Azogues, Cañar, Ecuador, on April 1, 1945, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector notes that the plant is sometimes used as a fever cure and is called "verbena echada" [*i. e.*, thrown-down verbena]. It has been found among weedy vegetation in hard gravelly soil, at an altitude of 2550 meters, blooming in February and September.

In all, 6 herbarium specimens, including the type, have been examined by me.

Citations: ECUADOR: Azuay: *Asplund 17801* (S, S); *W. H. Camp E.1851* (N, W--2056952); *Giler 31* (N). Cañar: *W. H. Camp E.2510* (N--type). Province undetermined: *L. Fraser s.n.* (Bm).

xVERBENA DERMENI Moldenke, Phytologia 2: 148. 1946.

Synonymy: *Verbena hispida x bonariensis* Dermen, Cytologia 7: 163, 164, 165, 170, 171, & 175. 1936. *Verbena dermenii* Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2210, sphalm. 1951.

Bibliography: Dermen, Cytologia 7: 163, fig. 18, 164, 165, fig. 28 & 29, 170, 171, & 175. 1936; Moldenke, Phytologia 2: 148. 1946; A. L. & H. N. Moldenke, Pl. Life 2: 56. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 164 & 197. 1949; Moldenke, Phytologia 3: 289. 1950; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2210. 1951; Moldenke, Am. Midl. Nat. 59: 345—346. 1958; Moldenke, Résumé 115, 118, 223, 359, 366, & 471. 1959; Moldenke, Résumé Suppl. 3: 37. 1962.

Illustrations: Dermen, Cytologia 7: 163, fig. 18, & 165, fig. 28 & 29. 1936.

This name has been proposed for the hybrid produced artificially in Massachusetts in 1936 by Dermen between *V. hispida* Ruíz & Pav. and *V. bonariensis* L. It is named in honor of Haig Dermen, contemporary Armenian cytologist and geneticist, born in Turkey and later research associate at the Arnold Arboretum in Jamaica Plain, Massachusetts.

The hybrid has been found nine times already in the wild and I am certain that it occurs commonly where the ranges of the two parental species overlap, as in São Paulo, Brazil, in Paraguay, and in at least two provinces of Bolivia, two provinces of Chile, and 9 provinces of Argentina. It seems very probable to me that some, at least, of the more or less "anomalous forms" of *V. brasiliensis* Vell. and of *V. litoralis* H.B.K. found in herbaria actually represent this hybrid, because its general appearance is much like that of a slender-spiked *V. brasiliensis* or a dense-spiked *V. litoralis*.

It is described by collectors as a suffrutescent herb, 0.5—1 m. tall, with blue or lilac-blue corollas. It has been collected at altitudes of 1400 to 3900 meters, in flower in January, February, April, and May, and in fruit in January and May. It is said to inhabit roadsides and swamps. Its characters are more or less intermediate between those of the two parents. It may be distinguished from *V. hispida* by the fact that its bractlets equal or but slightly surpass the calyx, and from *V. bonariensis* by its non-clasping leaves and more elongate pedunculate spikes which are solitary or in open panicles. Herbarium material has been misidentified and distributed under the names *V. bonariensis* L., *V. bonariensis* var. *longibracteata* Kuntze, and *V. littoralis* var. *caracasana* Kunth. The *Morong 1540* collection appears to be a mixture, because the Columbia University Herbarium specimen of this number is definitely *V. bonariensis*.

In all, 12 herbarium specimens and 4 mounted photographs have been examined by me.

Citations: BOLIVIA: La Paz: *Asplund 3565* (S, Us); *M. Bang 204* (C); *Buchtien 4459* (W—1177980), *5530* (W—1159359); *Mandon 523* (Bm); *H. H. Rusby 707* (C). PARAGUAY: *Hassler 3853* (Ca—944363); *Morong 1540*, in part (W—1416724); *T. Rojas s.n.* [Herb. Osten 18192] (F—photo, N, N—photo, Sg—photo, Ug, Ug, Z—photo).

VERBENA DISSECTA Willd. ex Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825 [not *V. dissecta* Morong, 1904, nor Poepp., 1847, nor Schau., 1959, nor Walp., 1849].

Synonymy: *Shuttleworthia dissecta* (Spreng.) Walp., Repert. Syst. Bot. 4: 12—13. 1845. *Shuttleworthia dissecta* Walp. ex Schau. in Mart., Fl. Bras. 9: 194, in syn. 1851. *Shuttleworthia dissecta* (Willd.) Walp. apud Moldenke, Lilloa 6: 327, in syn. 1941. *Verbena laciniata* Kuntze ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941 [not *V. laciniata* Briq., 1960, nor (L.) Briq., 1904, nor (Lam.) Briq., 1939, nor Sessé & Moc., 1940]. *Glandularia dissecta* (Willd.) Schnack & Covas, Darwiniana 6: 475. 1944. *Verebna dissecta* Augusto, Fl. Rio Grande do Sul 217, sphalm. 1946. *Verbena botryoides* Juss. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. *Verbena chamaedryfolia x erinoides* Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. *Glandularia disecta* Ragonese, Revist. Invest. Agric. 5: 83, sphalm. 1951. *Verbena chamaedrifolia x erinoides* Osten ex Moldenke, Résumé 361, in syn. 1959. *Verbena erinoides* Auth. ex Moldenke, Résumé 363, in syn. 1959 [not *V. erinoides* Chod., 1904, nor Hook., 1959, nor Hook. & Arn., 1959, nor L., 1959, nor Lam., 1791, nor Poepp., 1847, nor Spreng., 1830, nor Willd., 1947]. *Verbena dissecta* Spreng. ex Moldenke, Résumé 363, in syn. 1959.

Bibliography: Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825; Walp., Nova Act. Acad. Nat. Caes. Leopold.-Carol. Cur. 19: Suppl. 1: 379. 1843; Walp., Repert. Syst. Bot. 4: 12—13 & 33. 1845; Schau. in A. DC., Prodr. 11: 551 & 552. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 10. 1849; Schau. in Mart., Fl. Bras. 9: 193—194. 1851; Weddell, Chloris Andina [Castelnau Exped. Bot.] 2: 156. 1861; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 197. 1892; Jacks., Ind. Kew. 2: 895 & 1178. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 296—297. 1904; Reiche, Fl. Chile 5: 292. 1910; Herter, Florula Urug. 105. 1930; L. H. & E.

Z. Bailey, Hortus, new rev. ed., 632. 1935; Troncoso, Darwiniana 3: 483—486, fig. 2 & 3 g—n. 1939; Moldenke, Carnegie Inst. Wash. Publ. 522: 150. 1940; Moldenke, Prelim. Alph. List Invalid Names 56. 1940; Moldenke, Lilloa 6: 327—328. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 19 & 20. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39—42, 44, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 40 & 48. 1942; Moldenke, Lilloa 8: 429. 1942; Rosengurtt, Estud. Prad. Nat. Urug. 3: 235 & 236 (1943) and 4: 8. 1944; Moldenke, Lilloa 10: 383—384. 1944; Covas & Schnack, Revist. Argent. Agron. 11: 94 & 97. 1944; Schnack & Covas, Darwiniana 6: 471, 473, & 475 (1944) and 7: 71 & 73. 1945; Moldenke, Holmbergia 4: 151. 1945; Ind. Taxonom. 1 (14—16): 6. 1945; Cabrera, Bol. Arg. Soc. Bot. 1: 67. 1945; Moldenke, Phytologia 2: 79 & 114. 1945; Rosengurtt, Estud. Prad. Nat. Urug. 5: 394, fig. 36. 1946; Moldenke, Alph. List Cit. 1: 30, 47, 56, 73, 84, 93, 95, 96, 212, 218, 219, & 282. 1946; Augusto, Fl. Rio Grande do Sul 214, 217, & 233, fig. 103. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 9, 22, & 23. 1947; Moldenke, Phytologia 2: 338 & 386. 1947; Moldenke, Alph. List Cit. 2: 355, 364, 367, 375, 378, 426, 442, 458, 479, 533, 534, 599, 629, & 641 (1948), 3: 660, 670, 687, 688, 697, 703, 706, 732, 735, 745, 746, 748, 765, 766, 768, 780, 781, 803, 804, 838, 862, 874, 875, 908, 909, 911, 913, 914, 922, & 963 (1949), and 4: 1013, 1017, 1080, 1087—1092, 1100, 1168, 1172, 1202, 1209, 1211, 1215, & 1302. 1949; Moldenke, Phytologia 3: 135. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 98, 100, 101, 106, 163, & 197. 1949; Cabrera, Lilloa 20: 175. 1949; Castellanos & Ragonese, Lilloa 20: 259. 1949; Moldenke, Revist. Sudam. Bot. 8: 173. 1950; Moldenke, Phytologia 3: 467. 1951; Ragonese, Revist. Invest. Agric. 5: 40, 76, 83, & 208 (1951) and 6: 74, 76, & 206. 1951; Moldenke, Sp. Subsp. Cont. Mold. Set 45 [3]. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2210. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Rambo, Sellowia 6: 153 (1954) and 7: 260 & 266. 1956; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Am. Midl. Nat. 59: 356. 1958; Moldenke, Résumé 110, 115, 119, 121, 127, 223, 295, 344, 359, 361—363, 368, 379, & 471. 1959; Moldenke, Résumé Suppl. 1: 7 (1959) and 2: 11 & 12. 1960; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Reitz, Sellowia 13 (13): 110. 1961; Moldenke, Résumé Suppl. 3: 32 & 35 (1962), 4: 19 (1962), and 5: 6 & 7. 1962.

Illustrations: Troncoso, Darwiniana 3: 483, fig. 2, & 485, fig. 3 g—n. 1939; Rosengurtt, Estud. Prad. Nat. Urug. 5: fig. 36. 1946; Augusto, Fl. Rio Grande do Sul fig. 103. 1946.

Decumbent or prostrate perennial herb, often grown as an annual, canescent-hirsutulous throughout, stoloniferous; stems subligneous and suffruticose, subcylindric, much branched, mostly decumbent and trailing or creeping at the base, rooting adventitiously at the nodes, densely hirsute; branches ascending or erect, slender, subterete, usually 12—60 cm. tall, occasionally to 1 m. long; principal internodes short, 1—3 cm. long, but on floriferous stems elongated and 4—6 cm. long; leaves decussate-opposite, ovate, 2.3—4 cm. long, cuneate at the base, gradually attenuated and decurrent into the petiole, broadly tripartite with incised-dentate segments or pinnatifid-laciniate, strigose or hirsute above, spreading-hirsutulous or hirsute with rigid hairs (which are especially dense on the venation and margins) beneath, subrevolute or revolute on the margins, the leaf-segments linear or sublanceolate to linear-oblong, subobtuse at the apex, entire or sometimes toothed; inflorescence terminal, the spikes short, fastigiate, 2 or 3 times trichotomous, very densely many-flowered, corymbiform, often cymose-paniculate, not at all or hardly elongating after anthesis; peduncles short, imparting to the inflorescence the appearance of a dense-flowered umbel; bractlets oblong, 2—4 mm. long, much shorter than the calyx, acute at the apex, densely hirsute or white-pubescent; flowers spreading, not odorous or fragrant with the odor of vanilla; calyx tubular, elongate, 7—8 mm. long, about three times as long as the subtending bractlet, hirsute or densely white-pubescent, with large purple stipitate glands interspersed among the hairs on the angles, the rim unequally toothed, the teeth subulate-aristate; corolla hypocrateriform, varying from blue, bluish, sky-blue, bluish-rose, blue-rose, or pale rose-blue to violet, red-violet, purple-violet, clear-violet, pale-violet, lilac, lilac-red, pale-lilac, clear-lilac, blue-lilac, rose-lilac, red-lilac, or bright purple-lilac, sometimes purple, pink, pale-rose, rose, bright-rose, clear-rose, or even light-red, its tube 10—11 mm. long, slightly longer than the calyx, glabrous below and pubescent above on the outer surface, densely long-pilose within, the limb spreading, pubescent on the outside; stamens typical, the upper ones glandular-appendaged; anther-appendages blackish, cylindric or narrow-clavate, equaling the mouth of the corolla or somewhat exserted, glandulose; fruiting-calyx turgid, contorted at the apex; mericarps 2—3 mm. long, the cocci yellowish, subterete or more or less cylindric, about 0.7 mm. wide, rounded at the apex, truncate at the base, convex and striate dorsally and markedly reticulate-areolate except at the base, smooth and somewhat concave ventrally, the commissural face narrowly acute-angled, sub-bisulcate, and smooth; chromosome number: 2n = 10.

The type of this common southern South American species is Herb. Willdenow 11139, collected somewhere in Chile by Louis Née [Macbride photograph no. 17460]. The type of V. laciniata Kuntze was collected by Carl Ernst Otto Kuntze in Bolivia [Macbride photograph no. 17424]. V. chamaedryfolia x erinoides is based on Osten 3002 from Costa del Rosario, dept. Colonia, Uruguay, collected on October 24, 1894, growing between "V. erinoides" and "V. chamaedryfolia". I do not believe it to be of hybrid origin; it seems to be typical V. dissecta. The only true hybrid of this species known to me is with V. tenuisecta Briq. and is herein discussed under xV. nequam Moldenke.

It is worth noting here that the V. dissecta of Morong is V.

tenuisecta Briq., that of Schauer is *V. berterii* (Meisn.) Schau., and that of Poeppig and of Walpers is *V. sulphurea* D. Don; the *V. erinoides* of Chodat is *V. calliantha* Briq. and *V. storeoclada* Briq., that of Lamarck is *V. laciniata* (L.) Briq., that of Willdenow is *V. ciliata* Benth., and that of Hooker, of Hooker & Arnott, of Linnaeus, of Poeppig, and of Sprengel is *V. berterii* (Meisn.) Schau.; and the *V. laciniata* of Briquet and of "(Lamarck) Briquet" are *V. laciniata* (L.) Briq., while that of Sessé & Mocino is *Bouchea prismatica* var. *laciniata* Grenz. The *V. dissecta* f. *glandulifera* (Sanzin) Moldenke is *V. perakii* (Covas & Schnack) Moldenke.

Verbena dissecta inhabits dry, dry-arid, cultivated, sunny, and high dry soil, sandy banks, matorales, dry barren scrublands, quebradas, fields, pampas, and dunes. It has been collected along railroad tracks and road embankments, in grassy meadows and grassy fields, campos, parks and waste ground, wet meadows and rocky fields, pastures and barnyards, on stony hills and sandy-rocky hills, in brambly places and sandy places, on salty ground, among grasses, at the edges of small arroyos, in "campo abierto" and *Juncus acutus* swamps, often forming handsome carpets in waste soil and cultivated fields, at altitudes of 60 to 4000 meters. It has been collected in anthesis and fruit in every month of the year. Cabrera says of it "campestre poco frecuente"; Maldonado reports it as "abundany everywhere" in Santiago del Estero; Schulz says that it is abundant around Río Sali, but the plant is always small, while Jörgensen reports it as abundant at El Saladilla, Tucumán. Rosengurtt claims that in Uruguay it is found "en campos bajos y rastrojos".

Common names recorded for this plant are "cutleaf verbena", "margarita morada", and "margarita morado". Vervoorst asserts that the color of the corolla is that of "Maerz a. Paul Pl. 41 H-3", but that when dried the flowers lose their color.

Herbarium material has been misidentified and distributed under the names *V. cabrerae* Moldenke, *V. calliantha* Briq., *V. crinoides* Lam., *V. erinoides* Lam., *V. incisa* Hook., *V. laciniata* (L.) Briq., *V. microphylla* H.B.K., *V. pulchella* Sweet, *V. radicans* Gill. & Hook., *V. sulphurea* Sweet, *V. tenera* Spreng., *V. tenuisecta* Briq., and "*V. aff. erinoides* Lam." Osten determined some of his specimens as "*Verbena* Artengruppe *erinoides* Lam.", "*V. erinoides* Auth. an Lam.?", and "*V.* '*erinoides* Lam.' nach Briq. = *V. tenera* Sprengel".

On the other hand, the *Claude-Joseph 1248*, *3548*, *4456*, & *5053*, distributed as *V. dissecta*, are actually *V. berterii* (Meisn.) Schau.; *Claude-Joseph 4988* is *V. lipozygioides* Walp.; *Cook & Gilbert 549* is *V. microphylla* H.B.K.; *Sehnen 5052* is *V. tenera* Spreng.; and *W. E. Broadway 4997*, *Faris 478*, *Lazar 432*, *Morong 219*, *Pedersen 1323* & *3949*, *Rambo 51652*, and *F. A. Wetmore 830* are V. tenuisecta Briq.

Barker asserts that V. dissecta is "a verbena commonly cultivated in Puerto Rico gardens. It occurs in two varieties, pink and white." Troncoso says that it is cultivated in Argentina. Apparently it was first introduced into cultivation commercially in 1920. The Baileys (1935) assert that the material in the horticultural trade passing under this name is actually V. pulchella. The four specimens in the Bailey Hortorium herbarium examined by me, however, under this name, are true V. dissecta, so I think that Dr. Bailey was in error is his assertion.

Chicchi 264 is a mixture with V. hookeriana (Covas & Schnack) Moldenke. Troncoso (1939) gives the date of Weddell's reference as "1857", but the part referred to seems definitely to have been published first in 1860.

Schauer (1847) says of V. dissecta: "Habitus fere sequentes [V. erinoides Lam.], a qua vero sicut a praecedente [V. tenera Spreng.] praeter alia jam inflorescentia paniculata spicisque vix elongandis facile discriminatur." In his 1851 publication he amplifies this to "Habitus fere Verbenae erinoidis, a qua vero sicut a V. tenera differt; caule suffruticoso, hirsutie uberiore, spicis brevibus fastigiatis neque elongatis saepe in paniculam cymosam interdum amplam collectis; ab illa insuper recedit calycibus glandulis capitatis in sicco depressis obsitis, appendiculis antherarum majoribus. Variat statura foliisque modo cuneatis late tripartitis partitionibus inciso-dentatis, modo pinnatifido-laciniatis."

Troncoso (1939) says of V. dissecta: "nueva para la flora argentina. — Esta interesante especie conocida de Chile, Peru, Bolivia, Brasil y Uruguay, no habia sido citada hasta ahora para la Argentina. Probablemente, esto tenga por causa su afinidad con V. tenera Spr. y V. laciniata (Lam.) Briq., con las que puede facilmente confundirse. No seria de extranar que figurara en los herbarios bajo alguna de estas denominaciones. La encontre por primera vez en las barrancas de la localidad bonaerense de Campana y Posteriormente, en Julio del ano pasado, fue herborizada por el ingeniero Arturo Burkart en las barrancas riberenas de San Fernando, F. C. C. A. Los ejemplares coleccionados coincidan exactamente con la fotografia del tipo (no. 17460, de la serie del Field Museum de Chicago), lo que me permitio identificarla, pese a la brevedad de la diagnosis original..." She cites Burkart 3082, Troncoso 172, and Burkart 10191 from Buenos Aires, and Felippone 6118, 6975, & 2847, Hicken 74, and Rosengurtt 2116 1/2 from Uruguay, all in the herbarium of the Instituto Darwinion at San Isidro. She continues: "Los pocos autores......que se han ocupado de esta especie, coinciden en considerala como planta anual, solo Reiche.....duda de esta caracter. Indudablemente es una planta perenne; se halla en cultivo en el Darwinion desde mediados del ano pasado.....Es vecina a V. tenera Spr. y V. laciniata (Lam.) Briq., de las que se aparte por la inflorescencia en espigas mas densas y munca alargadas en la fructificacion, y por sus glandulas anterales de mayor tamano y netamente visibles en la garganta del tubo corolar.....El ejemplar leg. Burkart, SI. 10191, cultivado en el Darwinion, se ha desarrollado con todo vigor, formando en plena floracion como una gran mancha de color lila de mas de 1 m de extension. Su rapido crecimiento, su facil multiplicacion vegetativo por gajos y sus vistosas y perfumadas flores, hacen a esta planta muy recomendable para el adorno de los jardines."

Rosengurtt (1946) says "Mala hierba perenne, estolonífera achatada contra el suelo, de ciclo indefinido. Abunda en campos vírgenes y de rastrojo. Es constituyente accesorio de las estructuras degeneradas, y disminuye en los campos regenerados." In his 1943 work he says: "Hierba hemicriptófita y estolonífera cundidora; florece en primavera (agosto-enero). Habita laderas de tapiz bajo preferentemente donde sus tallos son acostados y cundidores, pero en los lugares no pastoreados, los tallos son erguidos y radicantes. Es muy común pero inútil, y decorativa cuando florece .....Esta planta fué publicada anteriormente por los autores.... con el nombre de V. tenera Spreng." Ragonese (1951) says "Hierba, con tallos decumbentes, que suele observarse en esta región en los terraplenes de las vías férreas y en los bordes de los caminos; de amplia dispersión ed Sudamérica. En Argentina habita desde Salta hasta Buenos Aires y Río Negro."

Walpers (1843 & 1845) cites Poeppig 157 for this species, but Schauer (1847) cites it for V. sulphurea. The latter author also (1847, 1851) cites Sellow s.n. from Uruguay, Née s.n. from Chile, Meyen s.n. from near Tissacoma, alt. 15,000 feet, Peru, and Lund s.n., Raben s.n., Riedel s.n., and Sellow s.n. from São Paulo, Brazil, all deposited in the Berlin, DeCandolle, and Willdenow herbaria. He points out that the Berlin specimens of Walpers' Shuttleworthia dissecta are all V. sulphurea. However, Walpers' binomial is plainly based on the Verbena dissecta of Willdenow and the name therefore belongs in this synonymy — the specimens seen by Schauer in the Berlin herbarium, since destroyed, were merely misidentifications on Walpers' part. Augusto (1946) cites Augusto & Edésio s.n. from Odório, Rio Grande do Sul, Brazil.

Schnack (1942) refers to a "V. aff. dissecta x V. peruviana", but just what this hybrid actually is has not yet been determined by me. Briquet (1904) suggests that V. selloi Spreng. may be conspecific with V. dissecta, but I am placing it in the synonymy of V. laciniata. Venturi 5264 was erroneously cited as V. callianthа Briq. in my Alph. List Cit. 4: 1090 (1949), while the Jörgensen 1613 cited as V. dissecta in the same work, 2: 599 (1948) is the type collection of V. andalgalensis Moldenke.

For a key to distinguish V. dissecta from related species, see under V. laciniata.

In all, 288 herbarium specimens and 7 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Jürgens 74 (B); Rambo 10103 (N), 48914 (N). São Paulo: Brade 7000 (N, N, Sp--6728); Collector undesignated 217 (Sp--20061); Freire & Azevedo 110 (Ja--24187); Löfgren s.n. [Itapetininga, Sept. 22, 1887; Herb. Comm. Geogr. & Geol. 3685] (N, Sp--15725). State undetermined: Raben 828 (Br); Sellow s.n. [Brasilia] (Br). BOLIVIA: Tarija: Troll 281 (B). Province undetermined: Kuntze s.n. [Macbride photos 17424] (Kr--photo, N--photo). URUGUAY: Collector undesignated s.n. [San Carlos, 8 Dec. 1884] (Ug); Commerson s.n. [Macbride photos 39502, in part] (Kr--photo); Felippone 6118 (W--1858371); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1433 (N), 1625 (Po--230976), 1821 (N), PE.5262 (Ml, N, N, Si); Herter 50882 (N), s.n. [Herb. Osten 17657] (Ug); Osten 3002 (Ug), 3305 (Ug), 4539 (Ug), 5642 (Ug), 6386 (Ug), 7793 (S, Ug, Ug), 10356 (S, Ug), 14676 (S, Ug), 16039 (Ug), 22096 (Ug); Rosengurtt B.2116 (N), B.3756 (Ml, N, N); Seijo 650 (Ug), s.n. [Colon, 30 Nov. de 1884] (Ug). CHILE: Province undetermined: Née s.n. [Herb. Willdenow 11139; Macbride photos 17460] (Kr--photo of type, N--photo of type, Z--photo of type). ARGENTINA: Buenos Aires: Boffa 330 (N); Cabrera 10712 (Mv); Carette s.n. [Monte Hermoso] (N); Collector undesignated s.n. (S); Commerson s.n. [Macbride photos 39502, in part] (Kr--photo, N--photo); Hauman s.n. [Sierra du Tandil, XII/1905] (Br); J. H. Hunziker 384 (S); Lefebre s.n. [Monte de Talas, La Plata, 1891] (Br); T. Meyer 6990 (S); Née 30 (Q), 96 (Q); Ruiz Huidobro 1176 (S). Catamarca: F. A. Barkley 19Ar561 (N); Brizuela 375 (N, Ok), 409 (N), 445 (N), 502 (N), 546 (N), 754 (N), 826 (N), 872 (N, Rf), 883 (N), 993 (N), 1037 (N), 1197 (N); Jörgensen 1613 [Herb. Inst. Miguel Lillo 31745; Herb. Osten 10676] (N, N, Ug); Luna Risso 394 (N), 423 (N); Malvarez 68 (N); B. L. Muller 51 (N), 109 (N); Pierotti 11529 [Herb. Inst. Miguel Lillo 28312] (Bm, Ut--115411b), "h" [La Merced] (Bm), s.n. [18/V/44] (Ca), s.n. [19/V/44] (Ca); Schreiter 1904 [Herb. Inst. Miguel Lillo 32759] (Ug--4912); Sleumer & Vervoorst 2369 (W--2173085); Venturi 7163 (Gg--161333). Chaco: Cabrera 3169 (Bt--43535, Ja--30410, N, N, S); A. G. Schulz 1470 (N), 1472 (N); C. L. Schulz 784 (S); Venturi 9780 (Gg--173450). Córdoba: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 31195] (N); Cuezzo 901 (N); T. Meyer 13726 (N, Sm); Ragonese 6256 [Herb. Inst. Bot. Minist. Agr. Nac. 68521] (N); Ragonese & Piccinini 6394 [Herb. Inst. Bot. Minist. Agr. Nac. 68411] (N); Ruiz Leal 12098b (Ss); Varela 404 (Ca--165151); Villafañe 29 (Gg--352669, Gg--353263, N, N), 120 (Gg--353264, N), 334 (N), 524 (N). Formosa: I. Morel 1477 (N). Jujuy: Cabrera 4055 (N, N); Eyerdam & Beetle 22317 (Ca--

652218); Schreiter 5013 [Herb. Osten 20754] (Ug); Venturi 5027 (W--1591454), 5264 [Herb. Osten 20796] (Ca--342620, Ca--376428, Gg--158394, Ug, W—1440785, W—1591466). La Pampa: Chicchi 264, in part (N). La Rioja: Afary 15 (Ut—115413b); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33882] (N); Cuezzo 973 (N); F. A. Roig s.n. [Ruiz Leal 15453] (Ss). Mendoza: Ruiz Leal 8497 (N), 8825 (N), 8883 (N); Semper s.n. [Ruiz Leal 9833] (N). Río Negro: U. S. Expl. Exped. [Wilkes] s.n. (T). Salta: R. M. Aguilar 286 (Bm, Ca); Barsini 731 (N); Cabrera 3004 (N, S); Dinelli s.n. [1906] (Bm); Lillo 10871 [Herb. Osten 8474] (Ug); Malvarez 175 (N), 206 (N), 245 (N), 609 (N, Rf); T. Meyer 12290 (N); Moldenke & Moldenke 19740 (Es, Lg, N, Ot, Sm); D. Rodriguez 19 [Herb. Inst. Miguel Lillo 31698] (N); F. A. Roig s.n. [Ruiz Leal 17880] (Rl); Ruiz Leal 12632 (Ss); Torrent s.n. [Laguna El Duraznito, 5-IX-1945] (N); Venturi 10301 (N); Zabala 116 [Herb. Inst. Miguel Lillo 38045] (N). San Luis: Ruiz Leal 11667 (Z). Santa Fé: Kuntze s.n. [Ceres, Oct. 1892] (W—701722). Santiago del Estero: H. H. Bartlett 20416 (Mi, W--1907572), 20428 (Mi); Cuezzo 2302 (S), 2325 (Gg—353273, N), 2384 (N), 2404 (N, Ok), 2492 (N, St), 3302 (S); Di Lullo 22 (Ug—6479); Luna Risso 11 (N), 83 (N); Maldonado B.185 (N); Pierotti 53 (Ca), "h" [El Cimbolar] (Bm, N), "n" (Bm), s.n. [31-III-1944] (S), s.n. [1.IV.44] (W--1934031), s.n. [6-4-44] (W--1934029); Ruiz Huidobro 3052 (N, Ok), 3108 (N), 3137 (N); Venturi 5754 (W--1591479); E. Wall s.n. [Inca, 9/11/46] (Ew), s.n. [Escolta, 9/11/46] (Ew); Wall & Sparre s.n. [Guardia, 9/11/46] (Ew). Tucumán: Baer 6 (S); Bailetti 231 [Herb. Inst. Miguel Lillo 31690] (N); Bruch s.n. [Valle de Tafé, 1908] (N); Jörgensen 86 [Herb. Osten 11490] (Ug); Lillo 1873 [Herb. Osten 8476] (Ug), 2022 [Herb. Inst. Miguel Lillo 31712; Herb. Osten 8475] (N, Ug), 15286 [Herb. Osten 8454] (Ug), 16128 [Herb. Osten 8450] (Ug); T. Meyer 3094 (N), 3368 (N, N), 4288 (Ml, N); Moldenke & Moldenke 19717 (N), 19720 (B, Es, F, Fy, Lg, Lm, Mg, Mr, N, No, Ot, Rs, S, Sm, Ss), 19753 (Es, Es, Lg, N); Monetti 1450 [Herb. Inst. Miguel Lillo 31692] (N), 3014 [Herb. Inst. Miguel Lillo 31721] (N), s.n. Herb. Inst. Miguel Lillo 31696] (Du--317602); Moretti 2113 [Herb. Inst. Miguel Lillo 31694] (Mv); O'Donell 4600 (N); Olea 4 (Ca—165410), 190 (Ca—164674); Peirano 9181 [Herb. Inst. Miguel Lillo 32894] (N); Schreiter 1904 [Herb. Inst. Miguel Lillo 32759] (N, N), 2358 [Herb. Inst. Miguel Lillo 32760] (N), 6522 [Herb. Osten 22968] (Ug), 8114 [Herb. Inst. Miguel Lillo 32758] (Ug--4938), 8116 [Herb. Inst. Miguel Lillo 32754] (N), s.n. [Tucumán, Aug. 12, 1917; Herb. Osten 12183] (Ug), s.n. [Tafí Viejo, July 8, 1923; Herb. Inst. Miguel Lillo 32758] (N), s.n. [Tapia—Cadillal, Herb. Osten 12181] (Ug), s.n. [Cadillal; Herb. Osten 12182] (Ug), s.n.

[Cumbrechica del Chorro; Herb. Osten 12198] (Ug); A. G. Schulz 2885 (N), 2889 (N); Scolnik, Araque Molina, & Barkley 21Tu005 (N); C. Skottsberg s.n. [Est. Agric. Exp. 16/10/1948] (Go); Terribile 162 (N), 289 (N), 325 (N), 338 (N); L. A. Varela s.n. [La Ramada, 8.III.1944] (N); Venturi 4 [Herb. Inst. Miguel Lillo 31729] (Au, N, W—1591207), 4b [Herb. Osten 17255] (Ug), 1042 [Herb. Inst. Miguel Lillo 31730; Herb. Osten 17253] (Du—372487, N, Ug, W—1591236), 1930 [Herb. Inst. Miguel Lillo 31732; Herb. Osten 17254] (N, Ug, W—1591246), 2303 (W—1591251), 2838 (W—1591269), 3180 [Herb. Osten 17252] (Ug, W—1591275), 3579 (Ca--342571, N, W—1343300), 4762 (S, W—1591444); E. Villa 523 (N), 527 (Gg—353262, N), 544 (N); Wall & Sparre s.n. [Tafí Vieja, 19/11/46] (Ew). Province undetermined: Friedmann s.n. [1923] (Ba); Hauman s.n. [Serra de Balearca, Nov. 1922] (Br); Moreno s.n. [Patagon. 50/3°, 1882—4] (N). CULTIVATED: Argentina: Vervoorst 493 (N). Dominican Republic: B. Augusto 290 (N). England: Nelmes 1113 (Ba); Stearn s. n. [Cambridge Botanic Garden, July 1931] (Ba, Ba). Puerto Rico: E. E. Barker s.n. [Rio Piedras, March 15, 1920] (Ba). LOCALITY OF COLLECTION UNDESIGNATED: Herb. A. Jussieu s.n. (N); Tweedie s.n. (N).

VERBENA DISSECTA f. ALBA Moldenke, Phytologia 2: 422. 1948.

Bibliography: Moldenke, Phytologia 2: 422. 1948; Moldenke, Castanea 13: 119. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 197. 1949; Moldenke, Alph. List Cit. 4: 1091. 1949; Howell, Wasmann Journ. Biol. 10: 377. 1952; Moldenke, Résumé 127, 425, & 471. 1959; Moldenke, Résumé Suppl. 1: 7 (1959), 2: 5 (1960), and 3: 29. 1962.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Santiago Venturi (no. 7068) in a prado at Balcozna, dept. Del Alto, Catamarca, Argentina, at an altitude of 1250 meters, on January 18, 1928, and is deposited in the herbarium of the California Academy of Sciences at San Francisco. The form has been collected at altitudes of 2 to 1250 meters, growing in dry soil and on sandy shores, flowering in January and September. It is said by E. E. Barker to be cultivated along with the typical form in Puerto Rico gardens. It has been misidentified and distributed in herbaria under the name V. laciniata var. albida Herter.

In all, 5 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: URUGUAY: Herter 1805 [Herb. Herter 96556] (Du—373695, N, Z). ARGENTINA: Catamarca: Venturi 7068 (F—photo of type, Gg—161452—type, N—photo of type, Si—photo of type, Z—photo of type). Tucumán: Venturi 5018 (W—1591453).

xVERBENA DISSOLUTA Moldenke, Phytologia 5: 133. 1955.

Synonymy: *Verbena erinoides* x *phlogiphlora* Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 20. 1942. *Glandularia laciniata* x *phlogiphlora* Schnack & Covas, Darwiniana 7: 73 & 75. 1945. *Verbena laciniata* x *phlogiflora* Dermen ex Moldenke, Phytologia 3: 467, nom. nud. 1951.

Bibliography: Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 20. 1942; Schnack & Covas, Darwiniana 6: 472 (1944) and 7: 73 & 75. 1945; Moldenke, Phytologia 3: 467 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 346. 1958; Moldenke, Résumé 223, 296, 372, 376, & 471. 1959; Moldenke, Résumé Suppl. 2: 11 & 12. 1960.

This hybrid was originally regarded by Schnack and Covas, who produced it artificially in Argentina in 1945, as being a cross between *V. laciniata* (L.) Briq. and *V. phlogiflora* Cham., and was so regarded by me in my discussion of hybridity in the *Verbenaceae* (1958). However, it now appears that what Schnack & Covas regarded as *V. laciniata* is actually *V. tenuisecta* Briq., so the hybrid is actually one between *V. tenuisecta* and *V. phlogiflora*. The two parental species occur rather commonly together in Paraguay, Uruguay, three states of Brazil, and at least four provinces of Argentina, so natural examples of this hybrid may be expected there. It should certainly have considerable horticultural merit, and so deserves further study and experimentation.

VERBENA DOMINGENSIS Urb., Symb. Ant. 5: 484. 1908.

Synonymy: *Verbena officinalis* Auct. ex Alain in León & Alain, Fl. Cuba 4: 281, in syn. 1957 [not *V. officinalis* Cuevas, 1930, nor L., 1753, nor Lour., 1845, nor Wats., 1942]. *Verbena domingense* Urb., in herb.

Bibliography: Urb., Symb. Ant. 5: 484. 1908; Prain, Ind. Kew. Suppl. 4: 245. 1913; Perry, Ann. Mo. Bot. Gard. 20: 262, 263, & 355. 1933; Moldenke, Prelim. Alph. List Invalid Names 46. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 25, 26, & 101. 1942; Moldenke, Phytologia 2: 87 & 115. 1945; Moldenke, Alph. List Cit. 1: 24, 64, 99, 138, 189, 216, & 285 (1946) and 2: 525, 554, 570, 645, 646, 649, 651, & 652. 1948; Moldenke, Castanea 13: 114. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 45, 48, & 198. 1949; Moldenke, Alph. List Cit. 3: 880 & 927 (1949) and 4: 1178, 1188, 1256—1259, & 1289. 1949; Alain in León & Alain, Fl. Cuba 4: 281. 1957; Moldenke, Résumé 53, 57, 371, & 471. 1959.

Erect or sprawling perennial shrubby herb, 30—60 cm. tall, growing in fasciculate fashion, or more or less sprawling, arching, scrambling, or even scandent and to 1 m. long; roots branched, producing very many rootlets at the apex; stems numerous from the root, branched, angulate-striate, 1—1.3 mm. in diameter above the base, smooth, glabrous, often becoming pale-purple, with only a few leaves; branches glabrous, mostly producing 3 spikes at their apex; principal internodes many times longer than the adjacent leaves; petioles 1—2 mm. long; leaf-blades varying from oval-elliptic or elliptic-oblong (lower ones) to lanceolate or linear (upper ones), 0.7—4 cm. long, 3--5 mm. wide, obtuse or acute at the apex, narrowed and decurrent into the petiole at the base, sparsely crenate or incised-crenate along the margins with 2—4 teeth on each margin, sometimes entire, scabrous above with basally inflated hairs, short-pilose beneath especially on the veins, the upper leaves decreasing in size, sparsely crenulate or entire and scale-like; spikes eventually 6—15 cm. long, lax, minutely pilose with erect hairs and a few slender glanduliferous ones; flowers rather lax; calyx about 1.5 mm. long, strigose or very short-strigillose on the outer surface, the sepals connate by a thin membrane, the rim short-dentate, the teeth acute; corolla varying from blue or dark-blue to purple-violet, purple, purple-red, lavender, or pink, scarcely 4 mm. long, the tube cylindric below, obconic-ampliate above, the limb 5-lobed, 2 of the lobes ovate-elliptic and half as long as the tube, the other 3 lobes somewhat longer-connate between themselves, the middle ones slightly longer and wider; stamens inserted at the middle of the corolla-tube; anthers subquadrate; style 0.8 mm. long, very shortly bilobed at the apex, one lobe convex and stigmatiferous, the other tooth-like and smooth; lower fruiting-calyxes many times shorter, upper ones one-half or one-third as long as the intervals between them; cocci brown, scarcely ober 1 mm. long, ribbed on the back, densely white-striolate with aised striae on the inner face.

The species was based on a collection by Baron Henrik Franz Alexander Eggers (no. 1828) from among limestone rocks on the banks of the Río Yaqui, at an altitude of 210 m., near Angostura, Dominican Republic, flowering and fruiting in May, and on one made by Carlo Guiseppe Bertero (no. 735) at an undesignated locality in the Dominican Republic, both deposited in the herbarium of the Botanisches Museum at Berlin. Urban says "Alia species hujus generis in Sto. Domingo sponte crescens, V. officinalis L., caulibus subsimplicibus, foliis pluries majoribus, pinnatifidis v. inferne pinnatipartitis, floribus majoribus: in Valle nuevo ultra sylvam umbrosam in paludosis 1970 m. alt.; Eggers n. 2175".

Holdridge describes the species as an "herb to 1 m. long, scandent", while the Howards say that it is an "arching plant in marsh", a "sprawling plant mainly in grass clumps", a "sprawling plant of grassy savannas", and a "sprawling herb in pine woods." Other collectors have found it in wet places, open grassy slopes, pine forests, waste ground, cultivated fields, sugarcane fields, on Eocene limestone ridges, at the edge of brooks, and in fissures of coral rock, at altitudes of 500 to 2500 meters, flowering and fruiting from March to January.

Ekman describes the species as a "weed in canefields" in Pinar del Río, but says that it is "rather rare" in Oriente, Cuba. Leonard calls it "scarce" in Haiti. A common name recorded for it is "verbena", a name applied to many other species of the genus and of related genera. Herbarium material has been misidentified and distributed under the names V. officinalis L., V. scabra Vahl, and as "Labiata sp. subaphylla". Britton, Britton, & Shafer 292 is a mixture with Stachytarpheta jamaicensis (L.) Vahl. Rugel states that his no. 121, cited below, is the same as his no. 856, not as yet seen by me.

It should be noted here that the V. officinalis of Cuevas is Stachytarpheta jamaicensis (L.) Vahl, that of Watson is Verbena menthaefolia Benth., while that of Loureiro is V. officinalis L.

Perry (1933) reduced V. domingensis to synonymy under V. officinalis L., saying: "On the whole, the specimens from Santo Domingo and Cuba differ from the typical V. officinalis in their slender and more elongate habit; the inflorescence is scarcely as glandular, the flowers are smaller, and the nutlets often do not exceed 1.5 mm. in length. Nevertheless, the Cuban specimens vary greatly in size, and Curtiss 677 is hardly separable from typical V. officinalis. Since many of the specimens are rather poor, it appears probable that they may very well represent an impoverished condition. Urban himself was somewhat uncertain of the status of his species as he appended the following note in a later publication: 'An re vera a formis V. officinalis L. separanda?'" To me the species looks more like Herter's V. gracilescens from southern South America than it does the big husky European V. officinalis. Nevertheless, in my 1940 publication, cited above, I followed her disposition of it -- a position since abandoned by me. The United States National Herbarium specimen of Curtiss 677, as pointed out by Perry, is not at all typical -- its many stems from a basal rosette of leaves cause it to resemble greatly V. halei Small; but other sheets of this collection have the typical more sprawling stems.

Perry cites the following 5 additional specimens not as yet seen by me: CUBA: Havana: Curtiss 677 (D, E, G). Province undetermined: C. Wright 3658 (G). HISPANIOLA: Haiti: E. C. Leonard 3939 (G).

In all, 77 herbarium specimens, including type material of all the names involved, and 3 mounted photographs have been examined by me.

Citations: CUBA: Havana: Alain A.785 (N); C. F. Baker 2591 (N, Po--63884); Baker, Tracy, & Hasselbring s.n. (Es--3098); Boldo 94 (Q); Britton & Cowell 10326 (N); Curtiss 677 (Cm, Es, Es, N, Vt, W--522300); Ekman 465 (S), 614 (S); León 131 (Ha), 6862 (Ha, N), s.n. [21-4-1921] (Se--30147, Vi); León & Edmund s.n. [Playa de Marianao, Abril 21, 1921] (N); Shafer 61 (Cm, Es). Las Villas: Fernando 297 (Ha, N). Matanzas: Britton, Britton, & Shafer 292, in part (Cm, Es); Rugel 121 (Bm, C). Oriente: Acuña, Alonso, & Pina 18801 (Es); Ekman 7960 (N, S). Pinar del Río: Ekman 10381 (S), 11196 (S). Province undetermined: C. Wright 98 [1865; Herb. Sauvalle 1744] (Hv), 3658 (Pa, W--71967). HISPANIOLA: Dominican

Republic: H. A. Allard 12468 (W--1955954), 14838 (N, S, W--1958659); Chardon 34 (Ba, N, N); Eggers 1828 (C--cotype, Le--cotype, N--photo of cotype, S--photo of cotype, W--940047--cotype, W--1672010--cotype, Z--photo of cotype); Ekman H.13581 (N, S, W--1711890); Fuertes 1771 (N), 1856 (N); R. A. Howard 12180 (N, N); Howard & Howard 9056 (N, W--2110920), 9083 (N, S, W--2110930), 9320 (N, W--2110976); J. de J. Jiménez 1067 (W--1882569), 2131 (W--1957796). Haiti: J. T. Curtis Jr. s.n. [July 27, 1944] (W--1881388); Ekman H.1560 (S, W--1411844), H.1569 (S, W--1411850), H.9314 (S); Holdridge 834 (Gg--316098, Mi, N, N, W--1880214); E. C. Leonard 3939 (N, W--1076321). CULTIVATED: Guadeloupe: Questel 1686 (W--1781452).

VERBENA DUSENII Moldenke, Phytologia 2: 422. 1948.

Bibliography: Moldenke, Phytologia 2: 422. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94 & 198. 1949; Moldenke, Alph. List Cit. 4: 1249 & 1250. 1949; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Angely, Bol. Inpabo. Inst. Paran. Bot. 14 & 15. 1955; Angely, Fl. Paran. 7: 6, 7, & 12 (1957) and 12: 17. 1958; Moldenke, Résumé 110 & 471. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Apparently a rather tall erect herb; stems and branches sharply tetragonal, minutely puberulent or eventually glabrescent on the larger parts, the upper portions often decidedly purplish, twiggy; principal internodes 2--9.5 cm. long; nodes annulate; leaves rather abundant, decussate-opposite, often with several smaller ones in their axils; petioles slender, 3--7 mm. long, margined and on the larger leaves often not distinct from the blade, minutely and sparsely puberulent, especially on the margins; leaf-blades ovate in outline, thin-chartaceous, somewhat lighter green beneath, 1.5--3.5 cm. long, 1--3.3 cm. wide, trifid-dissected, the lobes irregularly incised, acute at the apex, the lower ones widely divergent, very sparsely and minutely strigillose-puberulent on both surfaces (mostly on the lamina above and on the venation beneath), the very slender midrib and secondaries plane or subimpressed above, slightly prominulous beneath, a few short tertiaries often also discernible beneath; inflorescence spicate, terminal and in the uppermost axils, subcapitate-flattened during anthesis, the floriferous portion later elongating to 7 cm., dense, showy; peduncles rather stoutish, tetragonal, mostly purplish, 6--10 cm. long, rather sparsely strigillose with reflexed whitish hairs; bractlets conspicuous, green, rather broadly elliptic, 5--8 mm. long, 2--3.2 mm. wide, acuminate at the apex, glabrous except for the long-ciliate margins; calyx tubular, 9--10 mm. long, 1--1.5 mm. wide, 5-costate, purplish (especially on the ribs), densely white-hispidulous on the ribs, less so in age, the 5 teeth caudate-apiculate, 1.5--2 mm. long, purple; corolla showy, red or lilac, its tube about 15 mm. long, puberulent above the calyx, its limb 10--13 mm. wide, very sparsely puberulent on the outside, the lobes deeply cordate-notched at the apex; anthers glandular-appendaged.

The type of this very showy species was collected by Per Karl Hjalmar Dusén (*no. 7108*) -- in whose honor it is named -- in rather swampy ground at Pinhaes, Paraná, Brazil, on October 29, 1908, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The species is known thus far only from Paraná, and has been collected in anthesis only in October. It has been misidentified in herbaria as *V. pinnatisecta* Schau.

In all, 9 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: *Dusén 7108* (Ca--501688--isotype, F--photo of type, N--isotype, N--photo of type, S--type, Si--photo of type, W--1481768--isotype, Z--photo of type), *15779* (N, S); *Hatschbach 1519* (N), *2836* (N), *3135* (Z).

VERBENA EHRENBERGIANA Schau. in A. DC., Prodr. 11: 548. 1847.

Synonymy: *Verbena ehrenbergiana* DC. ex Moldenke, Résumé 363, in syn. 1959.

Bibliography: Schau. in A. DC., Prodr. 11: 548 & 555. 1847; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks., Ind. Kew. 2: 1178. 1895; Perry, Ann. Mo. Bot. Gard. 20: 246, 247, 259, 267--268, & 355. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 14, 18, & 101. 1942; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke, Alph. List Cit. 1: 178, 183, 194, & 203 (1946) and 2: 527. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 57. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 26, 32, & 198. 1949; Moldenke, Alph. List Cit. 3: 687, 752, 753, 829, 842, 891, 958, & 963 (1949) and 4: 986 & 1246. 1949; Moldenke, Résumé 31, 39, 363, & 471. 1959; Lewis & Oliver, Am. Journ. Bot. 48: 639. 1961.

Stems erect, tetragonal, hirsute, branched in paniculate fashion; leaves decussate-opposite, somewhat ovate, 4--10 cm. long, somewhat paler and prominently veined beneath, attenuate at the apex, cuneate at the base and narrowed into the margined petiole, trifid, strigillose above, hirtellous (especially on the venation) beneath, the segments or lobes small, lanceolate-oblong, acute at the apex, coarsely incised-serrate or serrate-dentate; spikes terminal, few, paniculately disposed at the ends of the stems and branches, filiform or very slender, remotely flowered, several inches long, strigillose; bractlets ovate, 1/3 or 1/2 as long as the calyx, acuminate or subulate at the apex, ciliate; flowers subopposite, very exiguous; calyx short, about 1.5 mm. long, narrow, obtuse, denticulate; corolla very small, inconspicuous, white, its tube scarcely longer than the calyx, the limb about 1 mm. wide; fruiting-calyx about 1.5 mm. long, strigillose, its lobes very short, obtuse, mucronate; cocci trigonous, about 1 mm. long, convex on the back, the commissural faces meeting sharply at right angles, almost smooth; chromosome number: n = 14.

The type of this species was collected by Carl August Ehrenberg (no. 713) near Los Reyes, in the state of México. Mexico, and was deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed. Schauer (1847) tentatively suggests that V. xutha Lehm. may belong in the synonymy of this species, but actually the two species are very distinct. He says, further: "Species per se quidem satis insignis, sed quoad habitum fere V. Carolinianae hirsutioris formam Schizophyllam exhibens. Spicae in apice caulis et ramorum paniculis pauperes struentes, pluripollicares, gracillimae, floribus suboppositis perexiguis. Calyx 3/4 lin. longus, angustus. Corolla minima, tubo calyce vix longiore."

Perry (1933) says: "In general habit this species somewhat approaches V. carolina. It differs, however, in its tripartite leaves, smaller flowers, and fruits. The collection from Saltillo [Palmer 2037] is much more densely hirsute on all parts, but apparently is conspecific."

Schauer places the species in his Section Verbenaca, Subsection Leptostachyae. It has been found in moist places, damp riverbeds, and densely wooded waterways, from 1600 to 2025 meters altitude, flowering in February, July, and August, and fruiting in July and August. The Muellers report that it is "rather common in dense woods" in Nuevo León. It has been misidentified and distributed in herbaria under the names V. carolina L. and V. polystachya H.B.K.

On the other hand, the Kellerman 5825, Türckheim 8442 & II.651, and L. V. Velasco 8999, distributed as V. ehrenbergiana, are actually V. carolina L.

In regard to the occurrence of V. ehrenbergiana in Arizona, C. T. Mason, Jr., in a letter to me dated January 26, 1955, says: "I have checked our herbarium for Verbena ehrenbergiana, and we do not have any representatives from Arizona. In fact, we have only two specimens, both of them from Mexico."

Miss Perry cites the following 13 specimens and photographs not as yet seen by me: MEXICO: Coahuila: Edw. Palmer 2037 (G). México: C. A. Ehrenberg 713 (E--photo of type). Nuevo León: Pringle 1948 (D, E, F, G). San Luis Potosí: Orcutt 5423 (E); C. A. Purpus 5451 (E, F, G); Seler 722 (G). Vera Cruz: Ervendberg 153 (D, G). What she cites as "Seler 722" is unquestionably Seler & Seler 722.

In all, 37 herbarium specimens and 2 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: ARIZONA: County undetermined: Stalmach 198 (Au). MEXICO: Federal District: Arsène 8829, in part (B). Hidalgo: M. T. Edwards 757 (Au); G. L. Fisher 3762 (W--1725465), 46169 (W--1889829), s.n. [Jacala, Aug. 12, 1937] (N); Liebmann 11335 (W--1315096). México: C. A. Ehrenberg 713 [Macbride photos 17414] (Kr--photo of type, N--photo of type). Michoacán: Arsène 8829, in part (N). Nuevo León: Mueller & Mueller 156 (Au, Me, Me), 1132 (Au, Me, Me, Mi); Pringle 1948 (Br, C, Ca--104822, Me, Mi, Pa, S, Vt, W--56190); M. Taylor 238 (Au). Puebla: F. Salazar s.n. [Pahuatlan, 12 July 1913] (Me, W--1169860). San Luis Potosí: C. A. Purpus 5451 (Ca--156750, N, W--463961); Seler & Seler 722 (W--1323087). Tamaulipas: Stanford, Retherford, & Northcraft 891 (Du-288695, N, Se--69700). Vera Cruz: Ervendberg 153 (Cb). LOCALITY OF COLLECTION UNDETERMINED: Ravn s.n. [N. Amer.] (Cp); Herb. Hornemann s.n. [N. Amer.] (Cp).

VERBENA ELEGANS H.B.K., Nov. Gen. & Sp. Pl. 2: 273. 1818.

Synonymy: Verbena moranensis Willd. ex Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825. Verbena elegans Humb. ex Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825. Verbena elegans Hort. ex Walp., Repert. Syst. Bot. 4: 33, nom. nud. 1845. Verbena elegans Kunth ex Schau. in A. DC., Prodr. 11: 554. 1847. Verbena lamberti Ker ex Schau. in A. DC., Prodr. 11: 554. 1847. Verbena moranensis H. & B. ex Schau. in A. DC., Prodr. 11: 554, in syn. 1847. Verbena canadensis subsp. elegans Thell., Fl. Advent. Montpel. 428. 1912. Verbena canadensis var. ehrenbergii Thell., Fl. Advent. Montpel. 428. 1912. Verbena elegans Schau. ex Thell., Fl. Advent. Montpel. 428, in syn. 1912. Verbena lambertii Ker ex Moldenke, Résumé 368, in syn. 1959 [not V. lambertii Sims, 1903].

Bibliography: H.B.K., Nov. Gen. & Sp. Pl. 2: 273. 1818; Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825; Ker in Lindl., Bot. Reg. 13: pl. 1102. 1827; Hook. & Arn., Bot. Beech. Voy. 305 (1838) and 484. 1841; Walp., Repert. Syst. Bot. 4: 30 & 33. 1845; Schau. in A. DC., Prodr. 11: 554. 1847; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks., Ind. Kew. 2: 1178 & 1179. 1895; Perry, Ann. Mo. Bot. Gard. 20: 248, 311, 319--320, & 355. 1933; Moldenke, Prelim. Alph. List Invalid Names 45 & 47. 1940; Moldenke, Alph. List Invalid Names 46 & 48. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18, 74, & 101. 1942; Moldenke, Alph. List Cit. 1: 53 & 178. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 23 & 25. 1947; Moldenke, Phytologia 2: 331 & 347. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 2: 393, 467, 573, 604, 617, & 639 (1948), 3: 679, 685, 696, 709, 717, 744, 752, 767, 830, & 833 (1949), and 4: 1074, 1076, 1119, 1255, 1295, & 1303. 1949; Moldenke, Phytologia 3: 132 & 141. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33, 164, & 198. 1949; Moldenke, Sp. Subsp. Cont. Mold. Set 45 [3]. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209--2211. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4 (1951) and 49 Spec. 3. 1954; Moldenke, Phytologia 5: 22. 1954; Moldenke, Résumé 39, 223, 360, 363, 368, 370, & 471. 1959; Moldenke, Résumé Suppl. 2: 11 (1960), 3: 8, 10, 15, 37, 39, & 40 (1962), 4: 4 (1962), and 5: 4. 1962.

Spreading or prostrate annual herb; stems prostrate-decumbent, procumbent, or creeping, tending to root at the older nodes, more or less diffusely branched, sparsely hispidulous-hirsute; branches ascending, often purplish, the older ones hirtous or hirsutulous, the younger ones hispid or hispidulous; petioles short; leaf-blades ovate or lanceolate-ovate, 2--5.7 cm. long, 2--3.5 cm. wide, incised-pinnatifid or trifid with the divisions less deeply cleft, cuneate or long-cuneate at the base and narrowed into the margined petiole, dark-green above, lighter beneath, often with branches or fascicles of smaller leaves in their axils, somewhat appressed-hirsute to strigose-hirtellous or -hispidulous on both surfaces, the divisions lanceolate to broadly oblong or linear-oblong, rather obtuse at the apex, entire to sparsely toothed or unequally incised-pinnatifid, subrevolute-margined, the ultimate lobes lanceolate, entire, acute; venation prominulous beneath; spikes terminal and axillary, solitary, pedunculate, about 2.5 cm. long during anthesis, fastigiate, capitate or fascicle-like, rather few-flowered but dense and compact, usually not much elongating after anthesis, hirsutulous and with a few glandular hairs intermixed, the peduncles about 2.5 cm. long; bractlets lanceolate or subulate-lanceolate, varying from half as long as to two-thirds as long as or about equaling the calyx, attenuate at the apex, glandular-hirsute or -hispidulous, ciliate; calyx 6--10 mm. long, more or less densely glandular-hispidulous or -hirsute, the rim very unequally 5-fid, the teeth short, unequal, subulate, the posterior ones shorter, the mouth therefore oblique; corolla hypocrateriform, showy, varying from red, violet, violet-rose, deep-pink, or vivid-pink to magenta-purple, lavender, dark-lavender, or blue, its tube about twice as long as the calyx, puberulent on the outside, barbate in the throat, the limb large, 10--12 mm. wide, the lobes emarginate; anther-appendages short; fruit about half as long as the fruiting-calyx; cocci subcylindric, 3.5--4 mm. long, rugose-reticulate or reticulate-scrobiculate chiefly on the upper half, the lower part striate; commissural face muriculate.

The type of this very handsome species was collected by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland between Moran and Regla, Hidalgo, Mexico, at an altitude of about 2600 meters. The type of *V. moranensis* is their *no. 4063*, from Moran, deposited in the Willdenow Herbarium at Berlin.

Verbena canadensis var. *ehrenbergii* Thell. was probably based on *C. Ehrenberg 130*, from Mexico, which is cited by Schauer in A. DC., Prodr. 11: 554 (1847) as *V. lamberti* Ker, a binomial which he credits erroneously to Ker, Bot. Reg. pl. 1102 and of which he says "Flores et fructus omnino V. Aubletiae, sed paulo majores" -- but the Lindl., Bot. Reg. 13: pl. 1102 illustration is of "*V. paniculata*" [=*V. hastata* L.].

Verbena canadensis subsp. *elegans* Thell. is based on *V. elegans* H.B.K. It is worthy of note here that the *V. lamberti* of Penny and of Sims are *V. canadensis* (L.) Britton, while that of Sprengel is *V. lasiostachys* Link, and *V. lambertii* Sims is also

V. canadensis. Verbena lambertii Ker was erroneously reduced to V. canadensis by me in my Résumé 368 (1959), but actually belongs in the synonymy of V. elegans.

Verbena elegans inhabits rocky fields and mountains, gravelly soil, dry slopes, cliffs, steep mountainsides with oaks and pines, and open forested slopes with pine-oak-madroño associations, from 1000 to 3165 meters altitude. It has been collected in anthesis from February to April, July to September, and November, and in fruit in February, April, July, and September. King describes it as "abundant in open sun" in Tamaulipas, while Feddema reports it as "uncommon in sandy loam in open sun on wooded slopes and barrancas" in Nayarit. It is called "showy verbena", and was introduced into cultivation in 1827. The L. P. McCann specimens cited below were grown from seeds secured from Copenhagen as V. canadensis. Bouchon 4782 is said to have originated in the southern United States and to be subspontaneous in the Botanical Garden at Bordeaux, France.

The Pringle 6908 cited below has its pubescence very short. Née 105 is a mixture with V. teucriifolia Mart. & Gal.

Herbarium material of V. elegans has been misidentified and distributed in herbarium under the names V. aubletia L., "V. aubletia forma", V. bipinnatifida Nutt., V. canadensis (L.) Britton, V. ciliata Benth, V. delticola Small, V. elegans var. asperata Perry, V. tenera Spreng., and V. wrightii A. Gray.

On the other hand, the Chute M.31, G. L. Fisher 3759, H. S. Gentry 2730, Edw. Palmer 191, and Stanford, Retherford, & Northcraft 566, distributed as V. elegans, are all actually var. asperata Perry; R. M. King 4249 is V. cameronensis L. I. Davis; Arsène 1671 is V. ciliata Benth.; and C. R. Orcutt 3551 is V. teucriifolia Mart. & Gal.

Walpers (1845) places V. elegans in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia with ten other species. Schauer (1847) cites Sweet, Brit. Flow. Gard., ser. 2, 4: pl. 353 as V. lamberti Ker, but this plate is cited by me as V. canadensis (L.) Britton. He also cites Mendez s.n. from Vallalpando, but comments that "fol. figura aliena, cor. majore tubo conspicue exserto". For his V. lamberti Ker he says "Intermedia quasi inter praecedentem [V. elegans] et sequentem [V. canadensis], ab illâ foliis minus divisis, floribus majoribus, ab hâc vero foliis profundius incisis incisuris integris patentibus distincta. Flores et fructus omnino V. Aubletiae, sed paulo majores." For V. elegans he says "Habitu, formis majoribus, V. erinoidis quodammodo accedens, sed corollâ magnâ jam satis distincta. Walpers says "Proxima V. erinoidi et V. Aubletiae, prioris varietatibus hanc adnumerarem si vidissem specimen siccum."

The colored illustration by Lindley in Bot. Reg. 13: pl. 1102 (1827) often cited as V. elegans is actually V. hastata L. Schauer (1847) mentions a "V. lamberti Ker" on the basis of an Ehrenberg specimen from Mexico.

Perry (1933) comments that V. elegans is "related to V. canadensis but is easily separable by its slender more or less prostrate habit, few-flowered compact spikes, and shorter calyx-teeth. The nutlets of the two are about the same size, but the reticulations in V. elegans are a little coarser than those in the more northern species." She cites the following 12 additional specimens not as yet seen by me: MEXICO: Hidalgo: Clokey s.n. [Real del Monte, 9 May 1910] (E); Humboldt & Bonpland 4063 (E--photo); Pringle 6908 (D, E, F, G), 11092 (E, F, G); C. A. Purpus 1433 (E). Oaxaca: Gandoger s.n. [Tehuantepec, 1906] (E). Vera Cruz: Seler 723 (G). Of Eggleston 10813 she says on the United States National Herbarium sheet "aff. V. Gooddingii Briq."

In all, 96 herbarium specimens and 2 mounted photographs, including type material of most of the names involved, have been examined by me.

Citations: ARIZONA: Cochise Co.: Eggleston 10813 (W--664875); A. R. Moldenke 146 (Am, Fg). Pima Co.: Barneby 2806 (N). MEXICO: Chihuahua: Knobloch 950 (Sm), 5904 (W--1791047). Coahuila: Purpus 4598 (Ca--144758). Federal District: E. Lyonnet 173 (N, W--1406392). Hidalgo: Clokey 1857 (Ca--882859); M. T. Edwards 862 (Au); Humboldt & Bonpland s.n. [inter Moran et Regla; Macbride photos 39479a] (Kr--photo of type, N--photo of type); E. Lyonnet 2231 (W--1748265); Martinez 11 (W--1791051); Matuda 21650 (N), 29558 (Z); H. N. Moldenke 19842 (Mg, No); Moldenke & Moldenke 19842 (B, Es, F, Fy, Lg, Lm, Mr, N, Ot, Rs, S, Sm, Ss), 19843 (Es, Lg, N, Sm); Pringle 6908 (Br, Ca--104710, Cm, Io--38754, Me, Me, Me, Mi, N, Po--63864, S, Vt, W--334766), 11092 (Cm, N, W--460474); Purpus 1433 (Ca--138829, Po--63880), s.n. [Pachuca, May 1905] (Ca--139757); Rose & Hay 5556 (W--395320); Rose, Painter, & Rose 8668 (N, W--452162); Sharp, Hernandez, & Goodman 44594 (N); Yates & Wilcox 155 (Ak--31225). México: C. L. Lundell 12210 (Ld). Michoacán: W. C. Leavenworth 292 (Ld). Nayarit: Feddema 653 (Mi). Nuevo León: Mueller & Mueller 158 (Au, Me); Tharp 1826 (Au, Au, Au). Oaxaca: Galeotti 779 (Br). Puebla: Bruff 1527 (Cb); Purpus s.n. [1907] (Ca--138832). Querétaro: Waterfall & Wallis 14159 (St), 14172 (St). San Luis Potosí: Mickel 517 (Mi). Sinaloa: H. S. Gentry 7181 (Ca--946136, Mi, N). Tamaulipas: R. M. King 4513 (N); H. W. Viereck 1047 (W--1687519). Vera Cruz: A. J. Sharp 44723 (O). State undetermined: C. A. Ehrenberg 130 (Vt); Keerl s.n. [Tlapujahua, 1829] (Br); Née 105, in part (Q); H. W. Viereck 253 [C. Victoria] (W--1687128). CULTIVATED: France: Bouchon 4782, in part (La). Germany: Golenz s.n. [Schwiebus, 1872]

(B). Maryland: *L. P. McCann s.n.* [9-15-36] (Md, Md). Massachusetts: *Leavitt s.n.* [Cambridge, 13 Oct. 1898] (Rf). Michigan: *C. F. Wheeler s.n.* [1891] (Po--63888). New York: *H. N. Moldenke 18462* (Ec, Jr, N, N, Si). Sweden: *A. Andersson 5* (Ew); *E. Wall 5* [1902] (Ew). Switzerland: *Bernet s.n.* (S).

VERBENA ELEGANS var. ASPERATA Perry, Ann. Mo. Bot. Gard. 20: 319-320. 1933.

Synonymy: *Verbena elegans asperata* Perry ex Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209. 1951.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 311, 319--320, & 355. 1933; H. S. Gentry, Rio Mayo Pl. [Carnegie Inst. Wash. Publ. 527:] 43, 222, & 306. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18, 74, 80, & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke, Phytologia 2: 79 & 115 (1945) and 2: 162. 1946; Moldenke, Alph. List Cit. 1: 19, 20, 40, 79, 100, 143, 203, 232, & 233 (1946) and 2: 481, 497, 527, 579, & 631. 1948; Moldenke, Wrightia 1: 230. 1948; Moldenke, Castanea 13: 119 & 121. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 23, 33, 107, 164, & 198. 1949; Moldenke, Phytologia 3: 141. 1949; Moldenke, Alph. List Cit. 3: 683, 753, 768, 784, 799, 807, 847, 879, 933, & 963 (1949) and 4: 989, 1071, 1099, 1111, 1164, 1170, 1175, 1233, 1245, 1246, 1255, & 1291. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Moldenke, Résumé 29, 39, 129, 223, & 471. 1959; Moldenke, Résumé Suppl. 2: 3 & 6. 1960; Lewis & Oliver, Am. Journ. Bot. 48: 639--641. 1961; Moldenke, Résumé Suppl. 3: 10, 29, & 37. 1962.

Illustrations: Lewis & Oliver, Am. Journ. Bot. 48: 640. 1961.

This variety differs from the typical form of the species in being stouter, more erect, in having its spikes densely many-flowered, elongating after anthesis, and the pubescence usually coarser and hardly or not at all glandular. It is described by collectors, however, as a prostrate, sprawling, or decumbent perennial or biennial herb, the flowers produced in large bunches, and the corolla varying from pink, bright-pink, vivid-pink, rose, deep-rose, or light-red to purple-red, reddish-purple, purple, bright-purple, rhodamine-purple, or magenta-pink.

The type of the variety was collected by Josiah Gregg (*no. 355*) at San Antonio, Coahuila, Mexico, on August 31, 1848, and is deposited in the herbarium of the Missouri Botanical Garden at St. Louis. Collectors have found the variety on limestone in oak woods, in sandy soil near rivers, in oak forests, mesquite grasslands, on mountains and mountainsides, in mountain meadows and humid mountain valleys, on rocky mountain slopes, dry mountain slopes with cut-over oak woods, rocky slopes, deserts, and pine-oak-madroña openly forested slopes, at altitudes of 330 to 3930 meters, flowering from February to October and fruiting from April to October.

Common names reported for this plant are "alfombrillo", "moradilla", and "verbena". Gentry states that it is a characteristic plant of arroyo margins, including meadows in pine forests, and that it is found on rocky meadow slopes in the Pine Forest belt and Transition Pine zone, at altitudes of 5000 to 7000 feet, blooming in summer. The Muellers found it "scattered in open woods" in Nuevo León. Stanford, Retherford, & Northcraft found it on mountains and in canyons with luxuriant vegetation, and on mountains with many bare sandstone outcroppings covered with low brush and herbs. Barkley encountered it "in red clay on limestone mountainside" and "in clay and limestone of mountainside". Martin says that it is a "very common flowering herb above 1400 m. in montane mesic forest, humid oak-pine woods, especially common along trails" in Tamaulipas; McVaugh found it to be "abundant in limestone mountains, oak forests" in San Luis Potosí; and Schneider found it "abundant on open rocky slopes" in Nuevo León.

Gentry reports that a decoction is made from its herbage and used for stomach afflictions in Chihuahua, but he says that it is "uncommon" on the Sonora-Chihuahua boundary. Pennington affirms that "a tea is prepared from this plant for stomach disorders and for catarrh".

For the probable exact location of collection of Stanford, Retherford, & Northcraft 566, which came from 18 km. west of Concepcion del Oro on the Coahuila-Zacatecas border, see my note under V. canescens H.B.K. The specimens of Weaver 585, cited below, bear a notation "same as 562", but I have not as yet seen the latter collection.

Material of this variety has been much confused, misidentified and distributed in herbaria under the names V. ambrosifolia Rydb., V. ambrosiifolia Rydb., V. aubletia L., V. bipinnatifida Nutt., V. canadensis Britton, V. ciliata Benth., V. delticola Small, V. elegans H.B.K., V. erinoides Lam., V. erinoides Willd., V. hybrida Voss, V. multifida Ruíz & Pav., V. pulchella Hort., V. pulchella Sweet, V. remota Benth., V. tenera Spreng., V. venosa Gill. & Hook., V. wrightii A. Gray, Shuttelworthia pulchella Meissn., and Shuttleworthia pulchella Meisn.

On the other hand, the H. S. Gentry 7181, distributed as V. elegans var. asperata, is typical V. elegans H.B.K.; Maysilles 7039 is V. ciliata Benth.; and Graber 183 is V. delticola Small.

The variety was apparently introduced into cultivation in 1883. The Bouchon 4782 cited below is said to represent plants that were both cultivated and subspontaneous in the Botanical Garden at Bordeaux, France. Dr. Bailey reports that seed which he planted at Ithaca, New York, on April 6 produced plants that flowered on August 10. His August 28, 1925, specimen bears a notation: "gland on back of anther — LHB." The Herb. Prager 18632 does not have any notation on its label indicating that it came from cultivated material, but I am assuming that it did. Burdick 23 was grown from seeds obtained from Amsterdam, while no. 24 was grown from seeds obtained from Cluj, Romania. The seeds for Bastedo s.n. came from Kew, England, those for G. V. Nash s.n. [7 S. 1898] from Geneva, Switzerland, and those for N. Y. Bot. Gard. Cult. Pl. 628 from Berlin, 1145 from Cambridge, 23187 from Hamburg, 23352 from Madrid, and 33298 from St. Louis. The seeds are handled by Haage & Schmidt in Erfurt. The Hort. Huber 753 specimen cited below bears a notation "Verbena pulchella Hort. est V. erinoides Lam. DC. p. 552, no. 64 (!)."

Perry (1933) cites the following 18 additional specimens not as yet seen by me: MEXICO: Chihuahua: Edw. Palmer 295 (G). Coahuila: J. Gregg 355 (E--type); Edw. Palmer 1052 (G); Purpus 4974 (E, F, G). Durango: Edw. Palmer 191 (E, G). San Luis Potosí: Edw. Palmer 51 (E, F, G); Parry & Palmer 720 (D, E, F); Schaffner 716 (G). Sonora: M. A. Crawford s.n. [Hermosillo, 1888] (G); Lumholtz 445 (G), 446 (G). She says "This variety, as compared with the species, is stouter and more erect with coarser pubescence and larger spikes. Palmer 191 differs from the other collections in having very shallowly lobed ovate leaves. Parry & Palmer 720 shows much variation in pubescence, some plants being scabrous, others scarcely so at all. Purpus 4974 is lacking the coarse pubescence but appears more closely allied here than elsewhere."

In all, 153 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: TEXAS: Duval Co.: Lewis & Oliver 5410 (Nb). Hidalgo Co.: Mrs. E. J. Walker 32 (N), s.n. [Feb. 9, 1942] (Au). MEXICO: Chihuahua: H. S. Gentry 2730 (Ca--582067, Fs, Ge, Me, Me, S, W--1686762); Knobloch 496 (Z), 1174 (Mi), 1288 (Mi), 1305 (Mi); Edw. Palmer 295 (W--56166); Pennington 68 (Bm), 369 (Bm). Coahuila: Kenoyer & Crum 2692 (Mi); E. W. Nelson 3896 (W--266885); Edw. Palmer 1052 (Pa, W--56158); Purpus 4974 (Ca--153292, W--842191). Durango: Edw. Palmer 191 (Ca--139760, N, W--571212). Hidalgo: F. A. Barkley 17M009 (Au--123219, Au--123229, N), 17M146 (Au--170048, N); V. H. Chase 7116 (Fs, Ld, N, N, Ur, Ur, Ur); Chute M.31 (Mi); L. I. Davis 205 (N), s.n. [Jacala, June 1941] (Au--172667); G. L. Fisher 3759 (W--1725462), 45198 (Ew, W--1894774), 46151 (Ew, Gg--353139), 46171 (W--1889831), s.n. [Jacala, Aug. 10, 1937] (Fs, N); Lundell & Lundell 12392 (N, Rf, Rf, Rf, W--1926600); Moore & Wood 3922 (Ba); Rowell 2020 (N). Nayarit: W. H. Lewis 5378 (Nb). Nuevo León: M. T. Edwards 129 (Du--278381); Meyer & Rogers 2579 (N), 3022 (N); Mueller & Mueller 328 (Mi); R. A. Schneider 927 (Mi); M. Taylor 129 (Ca--665000); J. N. Weaver 585 (N). Oaxaca: M. C. Johnston 53-691 (Au--122102, St). San Luis Potosí: McVaugh 12274 (Mi); Edw. Palmer 51 (Bm, Me, N, W--397598); Parry & Palmer 720 (Io, Pa, W--56186); F. W. Pennell 17879 (Mi, N, N, W--1640823); F. Rodriguez 17 (W--1490140, W--1490866); Rutten & Rutten-Pekelharing 464 (Ut--79606). Sinaloa: H. S. Gentry

6169 (Ge, N), 7181 (W--1945195). Sonora: Branson s.n. [August 15, 1959] (St); H. S. Gentry 670m (Fs, Mi); Shreve 5946 (Fs); S. S. White 3085 (Mi), 3964 (Mi), 4178 (W--2132338); Wiggins 11673 (Du-346240). Tamaulipas: L. I. Davis s.n. [Feb. 16, 1960] (Au--181592); P. S. Martin 551 (Mi); Rozynski 276 (Fs, Mi), 353 (Mi), 691 (Mi, N); Stanford, Lauber, & Taylor 2486 (Ca--987776, Gg--381242, N, N, W--2216750); Stanford, Retherford, & Northcraft 678 (Du--286303, N, Se--70560, Tu--10659), 1023 (Du--287085, N, Se--70645, Tu--16242); H. W. Viereck 194 (W--1687114). Zacatecas: Stanford, Retherford, & Northcraft 566 (Ca--713837, Du--288651, N, Se--69687, Tu--10912). State undetermined: Berlandier 1703 (Du--166490); Herb. Prager 18632, in part (Gg--31447). SWEDEN: A. Andersson s.n. [Sept. 1931] (Gg--222542). FRANCE: Bouchon 4782, in part (Mg--125). CULTIVATED: Connecticut: Bevoise s.n. [Aug. 1934] (Ba). Cuba: J. G. Jack 8617 (Gg--237848, N). Denmark: Lange s.n. [Sept. 15, 1919] (Ba). England: L. H. Bailey s.n. [Aug. 8, 1919] (Ba); Herb. Mus. Nac. Hist. Nat. Santiago 68314 (Sg); Nelmes 1151 (Ba). France: Hort. Huber 753 (Bm). Germany: Heiland s.n. [Lychen, Rutenberg, 10.VII.83] (Gg--31278); Herb. Prager 18632, in part (Gg--31448); Rehder s.n. [Hort. Bot. Berol., Aug. 30, 1885] (Ba). Massachusetts: L. H. Bailey s.n. [August 6--12, 1929] (Ba). New York: L. H. Bailey s.n. [Aug. 10, 1925; Haage & Schmidt seed 5201] (Ba, N--photo, Z--photo), s.n. [Aug. 28, 1925; Haage & Schmidt seed 5201] (Ba), s.n. [Aug. 28, 1925] (Ba); Bastedo s.n. [21 S. 1897] (N); Burdick 23 (Ba), 24 (Ba); Hartling s.n. [N. Y. Bot. Gard. Cult. Pl. 32403] (N), s.n. [N. Y. Bot. Gard. Cult. Pl. 33298] (N); G. V. Nash s.n. [N. Y. Bot. Gard. Cult. Pl. 628] (N, Qu), s.n. [N. Y. Bot. Gard. Cult. Pl. 1144] (N), s.n. [N. Y. Bot. Gard. Cult. Pl. 1145] (N), s.n. [N. Y. Bot. Gard. Cult. Pl. 1146] (N), s.n. [7 S. 1898] (N); R. C. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. 23187] (N), s.n. [N. Y. Bot. Gard. Cult. Pl. 23352] (N). Sweden: Blom s.n. (Go); E. Wall 5 [26/841] (S).

xVERBENA ENGELMANNII Moldenke, Revist. Sudam. Bot. 4: 18. 1937.

Synonymy: Verbena alta foliis urticae, floribus dilute coeruleis spicatim in summis caulibus congestis Gronov., Fl. Virg., ed. 2, 4. 1762. Verbena urticaefolio-paniculata Engelm., Am. Journ. Sci. 46: 101. 1844. Verbena paniculato-urticaefolia Engelm., Am. Journ. Sci. 46: 101. 1844. Verbena hastata x urticaefolia Brainerd, Bull. Vt. Agr. Sta. 187: 238. 1915. Verbena hastata x urticifolia Dermen, Cytologia 7: 170. 1936 [not V. hastata x urticifolia Gates, 1959]. Verbena hastata x urticifolia Blanchard ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. Verbena hastata x urticifolia Eggert ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. Verbena hastata x urticaefolia Norton ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. *Verbena urticaefolia* x *hastata* Farwell ex Moldenke, Revist. Sudam. Bot. 4: 18, in syn. 1937. *Verbena hastata* x *urticifolia* Perry ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. *Verbena hybrida* Bicknell ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941 [not *xV. hybrida* Voss, 1879]. *Verbena urticifolia* x *hastata* Schneck ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. *Verbena hastata* x *urticaefolia* Blanchard ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena hastata* x *urticaefolia* Chase ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena hastata* x *urticaefolia* Dutton ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena hastata* x *urticaefolia* Peck ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena hastata* x *urticifolia* Farwell ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena hastata* x *urticifolia* Pringle ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena urticifolia* x *hastata* Gates ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. *Verbena hastata* x *urticaefolia* McCoy ex Moldenke, Am. Midl. Nat. 59: 346, in syn. 1958. *Verbena hastata* x *urticaefolia* Pammel ex Moldenke, Am. Midl. Nat. 59: 346, in syn. 1958. *Verbena engelmanni* Moldenke, Résumé Suppl. 2: 11, in syn. 1960. *Verbena urticifolia* var. *paniculata* Engelm. ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962. *Verbena urticifolia paniculata* Engelm. ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962.

Bibliography: Gronov., Fl. Virg., ed. 2, 4. 1762; Engelm., Am. Journ. Sci. 46: 101. 1844; E. Brainerd, Bull. Vt. Agr. Exp. Sta. 187: 238. 1915; Dermen, Cytologia 7: 170. 1936; Moldenke, Revist. Sudam. Bot. 4: 18. 1937; Moldenke, Prelim. Alph. List Invalid Names 46, 47, & 49. 1940; C. C. Deam, Fl. Indiana 797 & 1232. 1940; Moldenke, Suppl. List Invalid Names 8 & 10. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 2, 3, 6, 7, 9, 11, & 101. 1942; Moldenke, Alph. List Invalid Names 47, 49, & 51. 1942; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 51: 127 (1942) and 52: 104. 1943; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 1. 1943; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 54: 95. 1945; Moldenke, Bot. Gaz. 106: 159. 1945; Moldenke, Castanea 10: 38. 1945; Moldenke, Am. Journ. Bot. 32: 609. 1945; Moldenke, Phytologia 2: 68, 80, & 115. 1945; Moldenke, Alph. List Cit. 1: 33, 41, 43, 89, 93, 110, 149, 150, 181, 184, 193, 195, 197, 213, 214, 224, 234, 236, 244, 248, 279, 282, 283, & 287. 1946; Moldenke, Phytologia 2: 327 & 347. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 24 & 27. 1947; Moldenke, Alph. List Cit. 2: 360, 395, 396, 398, 405, 438, 472, 477, 495, 513, 517, 520, 521, 547, 596, & 612 (1948), 3: 699, 719, 740, 744, 773, 790, 792, 793, 803, 807, 808, 831, 884, 904, 916, 930, & 946 (1949), and 4: 1119, 1138, 1162, 1173, 1175, 1176, 1189, 1201, 1238, 1251, 1255, 1260, & 1261. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 3--5, 12--17, 21, 164, & 198. 1949; Moldenke, Phytologia 3: 130 & 131 (1949) and 3: 374. 1950; Deam, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 59: 51. 1950; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 126, 129, & 130. 1952; Moldenke, Phytologia 4: 66 & 67 (1952) and 4: 185. 1953; Ahles, Bell, & Radford, Rhodora 60: 22. 1958; Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 2, 3: 126, 129, & 130. 1958; Moldenke, Am. Midl. Nat. 59: 346--348. 1958; Moldenke, Résumé 5--7, 10, 15--19, 21, 22, 26, 223, 365, 366, 371, 375, 377, 378, 421, & 471. 1959; Moldenke, Résumé Suppl. 2: 1--3 & 11 (1960), 3: 2, 4, 5, 38, & 41 (1962), 4: 13 (1962), and 5: 1--3. 1962.

Illustrations: Moldenke in Gleason, New Britton & Br. Illustr. Fl., pr. 1, 3: 130 (1952) and pr. 2, 3: 130. 1958.

This is the common natural hybrid between Verbena hastata L. and V. urticifolia L., occurring wherever the ranges of these two very common species overlap, and with intermediate characters. It resembles V. urticifolia in habit, but the spikes are denser, not greatly elongate after anthesis, very sparsely and irregularly fruited, the flowers caducous, the mature calyxes mostly contiguous, the corollas small, varying from blue, pale-blue, violet-blue, or light-blue to lilac, pale-lilac, light blue-violet, pink, pinkish, lavender, purplish, purple-blue, lilac-purple, or pale clear-purple, caducous, and the toothing of the leaves coarser and often double. The stems, branches, inflorescences, and leaves are usually subglabrous or sparsely strigillose, but may sometimes be very hirsute. In general, one may say that it can be distinguished from V. hastata by its much more slender and loosely flowered spikes and the color of the corollas, and from V. urticifolia by its very sparsely fruited spikes, colored corollas, and narrow-elliptic leaves.

It is one of the commonest of all the natural hybrids known in the genus Verbena, occurring abundantly in the eastern and central United States and somewhat in the southern section. That insects should so often transfer the pollen from one to the other of the two parental species is rather amazing, since, although they grow most commonly together or in close proximity, they are so very different in general appearance -- V. hastata having very dense-flowered spikes of usually deep-blue flowers and V. urticifolia having very loose and lax distant-flowered spikes of white flowers.

It is worth noting here that the "Verbena hastata x urticifolia" of Gates, at least insofar as the herbarium specimens which he so annotated and which have been seen by me are concerned, is xV. illicita Moldenke.

The type of xV. engelmannii was collected by Carl Andreas Geyer at Beardstown, Cass County, Illinois, in July, 1842, and was designated V. urticaefolio-paniculata by Engelmann in 1844. It is deposited in the Torrey Herbarium at the New York Botanical Garden. The *Verbena alta foliis urticae, floribus dilute coeruleis spicatim in summis caulibus congestis* of J. F. Gronovius (1762) seems to be this hybrid, but the pre-Linnean and Linnean synonymy which he gives apply to *V. urticifolia* L.

The type of *V. paniculato-urticaefolia* was collected by George Engelmann at Saint Louis, Missouri, in August, 1843. The type of *V. hybrida* Bicknell was collected by Eugene Pintard Bicknell (*no. 7351*) in Bronx County, New York, and is deposited in the Britton Herbarium at the New York Botanical Garden -- Mrs. Palmyra Mitchell has noted on the sheet in question that this name is preempted by that of "Vilm. Fl. de Pleine Terre Suppl. 95". The type of *V. hastata* x *urticaefolia* Blanchard was collected by William Henry Blanchard in Bennington County, Vermont, on August 11, 1902, deposited in the herbarium of the University of Vermont; that of *V. hastata* x *urticaefolia* Chase was gathered by Virginius Heber Chase (*no. 3230*) in Tazewell County, Illinois, and is deposited in the Britton Herbarium; that of *V. hastata x urticaefolia* Dutton was collected by Dura Lewis Dutton at Leicester, Addison County, Vermont, on August 7, 1915, deposited at the University of Vermont; that of *V. hastata* x *urticaefolia* McCoy was gathered by Scott McCoy (*no. 4170*) in Franklin County, Indiana, deposited at DePauw University; that of *V. hastata* x *urticaefolia* Norton was collected by John Bitting Smith Norton (*no. 792*, in part) in Riley County, Kansas, and is deposited in the herbarium of Kansas State College at Manhattan, mixed with x*V. illicita*; that of *V. hastata* x *urticaefolia* Peck was gathered by Morton Eaton Peck at Iowa Falls, Hardin County, Iowa, and is deposited in the herbarium of Iowa State College at Ames; that of *V. hastata* x *urticaefolia* Pammel was collected by Louis Hermann Pammel at St. Olaf, Clayton County, Iowa, on August 10, 1925, deposited at Iowa State College; that of *V. hastata* x *urticifolia* Eggert was gathered by Heinrich Karl Daniel Eggert at Saint Louis, Missouri, on August 4, 1875, deposited in the herbarium of the University of Texas at Austin; that of *V. hastata* x *urticifolia* Farwell was collected by Oliver Atkins Farwell (*no. 1426*) in Wayne County, Michigan, deposited in the herbarium of the Colorado Agricultural and Mechanical College at Fort Collins; that of *V. hastata* x *urticifolia* Perry was collected by Marcus Eugene Jones at Grinnell, Poweshiek County, Iowa, in August, 1875, deposited at Pomona College; that of *V. hastata* x *urticifolia* Pringle was gathered by Cyrus Guernsey Pringle at Charlotte, Chittenden County, Vermont, on July 15, 1887, deposited at the University of Vermont; and that of *V. urticifolia* x *hastata* Schneck was collected by Jacob Schneck in Harlin Riley's dooryard, Wabash County, Illinois, on September 1, 1897, deposited at the University of Illinois.

It is possible that the perplexing "*Verbena diffusa* Willd." ex J. Sm. in Rees, Cycl. 36: no. 18 (1817) may also represent this plant, which he says has "a near resemblance to *V. urtici-*

folia, with very small, somewhat purple, flowers". Rafinesque's V. incarnata may also belong here, but until I can see authentic material it is perhaps best not so to dispose of them.

Collectors have found xV. engelmannii in low ground and swampy or peaty borders, on creek banks and bottoms, in marshes, in dooryards and pastures, cow pastures and open ravine pastures, on canal banks and sandy black oak dunes, in clearings about landings, in marshy fields and ditches, on prairie strips and moist or dry banks, on the banks of field-draining ditches, along roadsides, in the vicinity of stockyards, and in low fields associated with Teucrium canadense L., Persicaria lapathifolia (L.) S. F. Gray, and Carex vulpinoidea Michx., in flower and fruit from July to October and in December. It has been found at altitudes to 2400 feet. Fassett states that he found it "in pasture with parents" and Shinners encountered it on a "stream bank with parents".

Herbarium specimens have been misidentified and distributed under the names V. carolina L., V. hastata L., V. hastata f. rosea Cheney, V. hastata var. oblongifolia Nutt., V. officinalis L., V. riparia Raf., V. scabra Vahl, V. stricta Vent., V. urticaefolia L., V. urticifolia L., V. urticifolia var. riparia Britton, and "Verbena hybrid".

On the other hand, the Ewan 19083 distributed as xV. engelmannii is V. montevidensis Spreng.; C. C. Crampton 369, distributed as V. urticifolia x hastata, is xV. illicita Moldenke, and the Bogusch 969, similarly distributed, is V. scabra Vahl.

As is to be expected, collectors' labels record the common names of the parents for this plant, "blue vervain" and "nettle-leaved vervain".

Grimes considered his specimens, cited below, as a hybrid between "V. urticaefolia" and V. stricta, while Eggert identified some of his specimens as "V. stricta x urticaefolia" and his August 12, 1875, collection as "V. stricta x angustifolia". Schneck found the hybrid growing among both parental species in a dooryard and makes the comment that it "looks like V. urticifolia, but the flowers are more like those of V. hastata." Shafer also says that he found his specimens actually growing between both parents. Deam describes his plants as being wide-spreading, "almost as wide as tall", and states that his no. 41978 is actually only the lower branch of a very large plant. Bicknell describes his plant as "long and spreading 2 1/2 feet, surface of tube and throat within minutely puberulent, racemes flexuous, spreading and drooping, mostly 10 to 12 in. long, greatest spread of panicle 22 inches" and "rather more harshly hairy than V. hastata, leaves with more irregular and spreading teeth, flowers a little smaller and paler." Ahles found his no. 6581 in a pasture with both parents and V. stricta Vent. Pammel refers to the plant as "a weed". G. N. Jones describes his no. 22339 as 2 meters tall; Monachino says of his no. 579 "growing with V. hastata, but flowers smaller"; Storm reports "plants not numerous, in about half acre of moist ground in stream bed." *Bicknell 7353a* consists of leaves only; these are very hairy and peculiar in shape.

The *Grace 353* cited below has very hirsute stems and does not look much like most specimens of this hybrid. *Norton 792* is a mixture with *xV. illicita*, while *F. A. Smith s.n.* [July 1896] is a mixture with *V. urticifolia*. The *Friesner 6450* collection is very close to typical *V. hastata*. His *nos. 18613*, *18618*, *18619*, and *18620* were all growing together, he says. Of these, *18618* is typical *V. urticifolia*, *18613* is typical *V. hastata*, *18620* looks much like *V. hastata* and had "blue" flowers, while *18619* has more distant "pink" or "pinkish" flowers. The last-mentioned was regarded by him as F_2 material. Gates records the hybrid from Crawford and Meade Counties, Kansas, while Deam and his associates report it from Fulton and Greene Counties, Indiana. It was apparently introduced into cultivation in about 1814.

Ahles, Bell, & Radford (1958) cite a *Collector undesignated s.n.* [bank of New River, Solitude P. O.] from Ashe County, North Carolina. The Walpole Island mentioned below is actually in Lambton County, Ontario. The specimen of *F. Garner s.n.* [Summer, 1925], cited below, bears a notation "W. F. K. Drawn, Mrs. Dickens, 1931", and is apparently the basis of an illustration not as yet seen by me. Iltis records the hybrid from Lafayette County and questionably from Milwaukee County, Wisconsin.

Miss Lulu O. Gaiser, in a letter to me dated February 1, 1960, makes the following interesting comments about this hybrid in Ontario: "Yes, the hybrid material had been so analyzed after my last (this) summer in the field. The *V. engelmannii* didn't 'click' until this summer, when I found the single plant of *no. 2395W*. The other one you saw, *no. 1692W*, was also a single plant and all I could find that day. But I had been looking for it all that day because I had found only the single plant, *no. 1522W*... on an earlier trip. You see, the very pale blue -- not purplish at all -- more sky blue color of each of these caught my eye. When I got this very rough *1522W* I surely thought I had a species that was absolutely new to me (I mean, neither *hastata* nor *urticifolia*, and I never thought of the hybrid between the two). But after I got *1692W* and then this year *2395W*, with the same pale blue flower and the typical *urticifolia* inflorescence in the latter number, I thought *1522W* was just another form of the same cross. Now your special comment about it seems very pertinent. *V. hastata* grows in low places, while this big tall rank specimen was picked off the top of the bank, so that as I drove along with the car, it towered its whole 5 feet (or about that) above me. The flower color was striking. I wish I could have found more of it. I looked for it again and found this *2395W* this summer not too far from its location. They surely are only *single* specimens."

In all, 197 herbarium specimens, including the types of almost all the names involved, have been examined by me.

Citations: ONTARIO: Walpole Island: Gaiser 1692W (Gp, Gp, Gp, Mm), 2395W (Gp, Mm). VERMONT: Addison Co.: Dutton s.n. [Leicester, August 7, 1915] (Vt). Bennington Co.: W. H. Blanchard 65 (N), s.n. [North Pownal, Aug. 11, 1902] (Dt, Vt, Vt). Chittenden Co.: Pringle s.n. [Charlotte, 15 July 1887] (Vt). Windham Co.: L. A. Wheeler s.n. [Townshend, 5/23/23] (Go, S). NEW YORK: Bronx Co.: E. P. Bicknell 7336 (N), 7348 (N), 7350 (N), 7351 (N), 7352 (Al, It); H. N. Moldenke 18463 (Aa, Ec, Jr, Jr, Ml, N). Nassau Co.: E. P. Bicknell 7353a (N), 7353e (N). Richmond Co.: Monachino 579 (N, Z). Tompkins Co.: C. H. Peck s.n. [Freeville] (Al). Ulster Co.: Elting 2074 (Al). NEW JERSEY: Morris Co.: Brenning s.n. [Lake Hopatcong, 4 Aug. 1902] (B); Mackenzie 4746 (N, N). PENNSYLVANIA: Allegheny Co.: Holz s.n. [Pittsburg, 1831] (S). Crawford Co.: Shafer s.n. [July 23, 1901] (Cm). Delaware Co.: F. W. Pennell 14695 (Cm). Luzerne Co.: J. K. Small s.n. [Lily Lake, August 15-16, 1889] (W--298653). Montgomery Co.: Wismer 535 (Up). Philadelphia Co.: Bassett s.n. [Pennypack Park, Oct. 5, 1927] (N). Union Co.: Westerfeld 2377 (Ur). County undetermined: Schweinitz s.n. [1829] (Br). MARYLAND: Washington Co.: H. N. Moldenke 21762 (Z). VIRGINIA: Princess Anne Co.: Fernald & Long 12453 (W--1971125). WEST VIRGINIA: Pocahontas Co.: C. B. Clarkson 1585 (We). Preston Co.: Bartholomew & Vail s.n. [Big Sandy Creek, August 15, 1959] (We). OHIO: Champaign Co.: E. C. Leonard 20462 (W--2006949). Lorain Co.: A. A. Wright s.n. [July 30, 1889] (Ob--75328). Lucas Co.: Moseley s.n. [Aug. 2, 1925] (Ob--97293). NORTH CAROLINA: Ashe Co.: Collector undesignated s.n. [Solitude P. O] (Hi--59476). ILLINOIS: Adams Co.: R. A. Evers 802, in part (Ur, Ur), 807 (Il--15901). Cass Co.: Geyer s.n. [Beardstown, July 1842] (T--type). Champaign Co.: Ahles 2911 (Ur, Ur, Ur); R. A. Evers 1604 (Ur); G. N. Jones 16761 (Ur). Crawford Co.: Ahles 4900 (Ur, Ur, Ur). Hardin Co.: Ahles 2754 (Ur). Henry Co.: V. H. Chase 6910 (Ur, Ur), 6911 (Ur). Iroquois Co.: Ahles 2538 (Ur); Winterringer 6452 (Il--33730). Jo Daviess Co.: Pepoon & Moffatt 254 (Ur). Piatt Co.: Ahles 6580 (Ur), 6581 (Ur). Sangamon Co.: G. D. Fuller 5271 (Il--15859), 5479 (Il--15866), 6585 (Il--15869). Stephenson Co.: Eggert s.n. [August 12, 1875] (I). Tazewell Co.: V. H. Chase 3230 (Al, Ca--882654, Il--15816, N, Ur, W--1897066). Vermilion Co.: Storm s.n. [July 28, 1949] (Ur). Wabash Co.: Schneck s.n. [Sept. 1, 1897] (Ur); Schneck & Waite s.n. [Mt. Carmel, Aug. 5, 1887] (Ur--30014). Winnebago Co.: M. S. Bebb s.n. [Fountaindale] (Al). INDIANA: Boone Co.: S. McCoy 5294 (Bt--51727). Carroll Co.: Ek s.n. [west of Burlington, 8-7-1941] (Bt--57641). Cass Co.: Friesner 6450 (Bt--14065). Clinton Co.: C. C. Deam 41978 (Dm, Mg--202).

Franklin Co.: S. McCoy 4170 (Dp—4662). Fulton Co.: Friesner 23110 (St). Hancock Co.: Friesner 18619 (Ca—882638, Gg—323905, N, N, Pl—153592), 18620 (N, N, We); S. McCoy 828 (Dp—4671). Putnam Co.: Grimes 2083 (Dp). Warrick Co.: C. C. Deam 29006 (In). IOWA: Clayton Co.: L. H. Pammel s.n. [St. Olaf, Aug. 10, 1924] (Io—115923). Hardin Co.: Peck s.n. [Iowa Falls] (Io). Johnson Co.: L. H. Pammel 708 (Io—119267, Mg—195). Lee Co.: I. Mitchell 172 (Io—115868). Muscatine Co.: Pammel, Kelso, & Harlan s.n. [Jul. 20, 1919] (Io—95044). Poweshiek Co.: M. E. Jones s.n. [Grinnell, August 1875] (Po—71239). Story Co.: J. R. Campbell 67 (Io—84561). TENNESSEE: Carroll Co.: Eggert s.n. [Hollow Rock, 4 & 5 Aug. 1897] (Cm, N, W—754370). MICHIGAN: Cass Co.: Pepoon 1347 (Mi). Oakland Co.: Farwell 5159 (Mi). Saint Clair Co.: Farwell 6741 (Mi). Wayne Co.: Farwell 1426 (Fc), 8461 (Mi), s.n. [Detroit, Sept. 25, 1893] (C); H. H. Rusby s.n. [Detroit, Aug. 1884] (Mi). WISCONSIN: Dane Co.: C. C. Albers 33015 (Au); A. B. Seymour 1062 (Ws). Grant Co.: H. H. Smith 7821 (B). Lafayette Co.: Shinners 2358 (Ws). Milwaukee Co.: Lapham s.n. [Milwaukee] (Ws). Vernon Co.: Fassett 20233 (Ws); H. H. Smith 7274 (B), 7366 (B). KANSAS: Bourbon Co.: Clothier & Whitford s.n. [Aug. 11, 1897] (Ka). Brown Co.: F. Garner s.n. [Summer, 1925] (Ka—72011). Cloud Co.: Carleton s.n. [July 18, 1888] (Ur). Linn Co.: Brooks & Brooks s.n. [1928] (Cm). Nemaha Co.: A. S. Hitchcock s.n. [Dec. 11, 1896] (Ka). Pottawatomie Co.: Kimball s.n. [St. George, Aug. 12, 1888] (Ka). Republic Co.: F. A. Smith s.n. [July 1896] (Ka). Riley Co.: J. B. S. Norton 792, in part (Ka, N, W—353583). MISSOURI: Greene Co.: P. C. Standley 8612 (W—687555). Marion Co.: G. N. Jones 22339 (Ur). Saint Louis: Eggert 5323 (N), s.n. [Mississippi Valley, Aug. 4, 1873] (N), s.n. [St. Louis, Aug. 4, 1875] (Au, B, Bi, Ca—181535, Ca—425200, Ca—882858, Cm, Cm, Du—202133, Gg—183218, Go, In, Io—79865, Mn—6885, N, Po—192591, Tl, Up—60775, W—754957), s.n. [St. Louis, Aug. 8, 1875] (Au, B, Ca—183180, Ca—425202, Cm, Du—202131, Gg—183216, Io—79868, Mn—6896, N, Po—192593, Up—60751, Up, W—754954), s.n. [St. Louis, Aug. 1875] (Up—60750), s.n. [12 Aug. 1877] (Al, I); Engelmann s.n. [St. Louis, Sept. 1841] (W—71971), s.n. [St. Louis, July 1843] (Dt), s.n. [St. Louis, Aug. 1843] (Br, Pr, Pr, T), s.n. [St. Louis, Aug. 1865] (Dt), s.n. [St. Louis] (Br, S, Sg—16097); Glatfelter s.n. [near St. Louis, 8-10-94] (Mi), s.n. [St. Louis, 8-11-94] (W—309644); Lindheimer s.n. [St. Louis, July 1839] (Dt); M. Martens s.n. (Br). OKLAHOMA: Kingfisher Co.: Grace 353 (Ok—19032). CULTIVATED: Spain: Herb. Hort. Reg. Matrit. 26 (Q). LOCALITY OF COLLECTION UNDESIGNATED: A. Murray 32 (S); Swederus s.n. (S).

xVERBENA ENGELMANNII f. ALBIFLORA Moldenke, Résumé Suppl. 3: 2, nom. nud. (1962), f. nov.

Haec forma a forma typica hybridae corollis albis recedit.

This form differs from the typical form of the hybrid in having white corollas.

The type of the form was collected by George Hill Mathewson Lawrence and W. J. Dress (*no. 570*) in marshy ground 2.4 miles west of Chip Bottom, Ocean County, New Jersey, on August 21, 1948, and is deposited in the herbarium of the University of California at Berkeley. It is described as a perennial 1 meter tall. Thus far the form is known only from the type specimen.

Citations: NEW JERSEY: Ocean Co.: *Lawrence & Dress 570* (Ca—805325—type).

VERBENA EPHEDROIDES Cham., Linnaea 7: 260—261. 1832.

Synonymy: *Verbena virgata* Sellow ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941 [not *V. virgata* Ruíz & Pav., 1798]. *Verbena valerianoides* St.-Hil. ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947 [not *V. valerianoides* H.B.K., 1818]. *Verbena isabelleana* Briq. ex Moldenke, Résumé Suppl. 1: 23, in syn. 1959.

Bibliography: Cham., Linnaea 7: 260—261. 1832; Walp., Repert. Syst. Bot. 4: 17. 1845; Schau. in A. DC., Prodr. 11: 543. 1847; Schau. in Mart., Fl. Bras. 9: 191. 1851; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 1, 86, 150, & 168. 1878; Griseb., Abh. K. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 276. 1879; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147. 1894; Jacks., Ind. Kew. 2: 1178. 1895; Briq., Ann. Conserv. & Jard. Bot. Genév. 10: 101. 1907; Glaz., Bull. Bot. Soc. France Mém. 3: 544. 1911; Seckt, Rev. Univ. Nac. Cordoba 17: 90. 1930; Herter, Florul. Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 41, & 101. 1942; Moldenke, Phytologia 2: 75, 87, & 115. 1945; Moldenke, Alph. List Cit. 1: 195. 1946; Moldenke, Phytologia 2: 336 & 338. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 27. 1947; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 2, 86, 150, & 168. 1947; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 3: 687 & 923 (1949) and 4: 1123, 1124, 1250, 1257, & 1288. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 100, 106, & 198. 1949; Moldenke, Phytologia 3: 453. 1951; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 110, 119, 127, 378, & 471. 1959; Moldenke, Résumé Suppl. 1: 23. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Bushy perennial or frutescent herb, to 1.2 m. tall, much branched, subaphyllous; stems, branches, and branchlets slender, rush-like, sharply 4-angled, margined, the alternate faces sulcate, glabrous and smooth, the branches and branchlets very numerous and spreading; nodes annulate, somewhat contracted; principal internodes 2.5—6.3 cm. long; leaves mostly rudimentary.

NOTES ON NEW AND NOTEWORTHY PLANTS. XXXV

Harold N. Moldenke

CITHAREXYLUM MATUDAE Moldenke, sp. nov.

Arbor 7 m. alta; ramis ramulisque crassis perobtuse tetragonis albo-griseis, non marginatis vel alatis, glabris; cicatricibus foliorum valde divaricatis percrassis suberosis; sarmentis in siccitate nigrescentibus; foliis ellipticis integris ad basin apicemque acuminatis, supra glabris, subtus parcissime pilosulis; spicis axillaribus terminalibusve solitariis elongatis multifloris ubique glabris.

Tree, 7 m. tall; branches and older branchlets stout, very obtusely tetragonal or subterete, not at all angled nor margined nor alate, very light gray in color, prominently lenticellate; nodes more or less annulate; principal internodes 1--4.5 cm. long; leaf-scars widely divergent, very conspicuous, very thick and corky, decussate; young twigs more slender, blackening in drying, glabrous, lenticellate; leaves decussate-opposite; petioles slender, 2.5--5 cm. long, glabrous, nigrescent in drying; leaf-blades chartaceous, lighter beneath, nigrescent or brunnescent above in drying, elliptic, 6--14 cm. long, 3--7 cm. wide, acuminate at the base and apex, entire, glabrous above, very sparsely and obscurely pilosulous beneath, more densely so along the midrib; midrib slender, flat above, prominent beneath; secondaries slender, ascending, slightly arcuate at the tips, 6--10 pairs, flat above, prominulous beneath; veinlet reticulation indiscernible above, abundant and plain but not elevated beneath; inflorescence axillary or terminal, spicate, solitary; spikes 7.5--25 cm. long, many-flowered and many-fruited, erect in anthesis, apparently drooping in fruit; peduncles very short or subobsolete, glabrous, nigrescent in drying in anthesis; rachis rather slender and nigrescent in drying during anthesis, very heavy and similar in texture and color to the branches in fruit; flowers numerous, very shortly pedicellate; pedicels slender, 1--2 mm. long in anthesis, much thickened and somewhat longer in fruit; bractlets single under each pedicel, 1--2 mm. long, linear-lanceolate or subulate, glabrous; calyx campanulate, 4--5 mm. long and wide, minutely puberulous toward and at the rim, otherwise glabrate and shiny, nigrescent in drying, the rim truncate, minutely 5-toothed; fruiting-calyx greatly incrassate and indurated, 6--8 mm. wide, subpatelliform, glabrate, slightly verruculose on the outer surface, the rim shallowly erose, not distinctly toothed nor lobed; fruit drupaceous, subglobose, about 1 cm. long and wide, nigrescent and much wrinkled in drying.

The type of this species was collected by Eizi Matuda (no. 5467) — in whose honor it is named — in a virgin forest at Pinabeto, near the Guatemalan border, near Motozintla, at 2585 meters altitude, Chiapas, Mexico, on July 9, 1945, and is deposited in the C. L. Lundell Herbarium at Renner, Texas.

LANTANA HISPIDA f. ALBA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Elias Contreras (no. 1056) on the top of Temple IV, Tikal, Tikal National Park, El Petén, Guatemala, on June 9, 1960, and is deposited in the C. L. Lundell Herbarium at Renner, Texas.

LANTANA VELUTINA f. ALBIFRUCTA Moldenke, f. nov.

Haec forma a forma typica speciei fructis albis recedit.

This form differs from the typical form of the species in having white fruit.

The type of the form was collected by Cyrus Longworth Lundell and Amelia L. Lundell (no. 12320) on the mountainside near Taxco, at km. 157 on the Acapulco Highway, Guerrero, Mexico, on August 1, 1943, and is deposited in the herbarium of the Texas Research Foundation at Renner, Texas.

LIPPIA PRINGLEI f. INTECTA Moldenke, f. nov.

Haec forma a forma typica speciei laminis foliorum subtus puberulis pilis brevissimis recedit.

This form differs from the typical form of the species in having the lower leaf-surfaces merely very short-puberulent with rather distant hairs.

The type of this form was collected by Efraim Hernandez Xolocotzi (no. 125) at El Llano, south of San Blas, Nayarit, Mexico, on January 7, 1944, and is deposited in the herbarium of the Texas Research Foundation at Renner, Texas. It is said to be a tree 3--6 meters tall, with white flowers, and called "tacote".

STACHYTARPHETA GUATEMALENSIS f. ALBIFLORA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Elias Contreras (no. 1579) in an airfield clearing at Dos Lagunas, El Petén, Guatemala, on November 3, 1960, and is deposited in the C. L. Lundell Herbarium at Renner, Texas.

STACHYTARPHETA PETENENSIS Moldenke, sp. nov.

Herba; caulibus subteretibus parcissime pilosulis vel glabratis; foliis decussatis tenuiter membranaceis lanceolatis utrinque subglabris ad apicem argute acutis, ad basin longe acuminato-alatis, margine grosse serratis; spicis simplicibus elongatis dense multifloris, rhachide valde excavato; bracteolis lanceolatis, ad apicem longe attenuatis; corollis rubris.

Herb, apparently simple or subsimple, with a few abbreviated branches in the upper axils; stems subterete, brown in drying, very obscurely and minutely scattered-pilosulous or subglabrate throughout; nodes not annulate; principal internodes 5--6 cm. long; leaves decussate-opposite, the lower ones usually with a few small ones in their axils, thin-membranous, brunnescent in drying, slightly lighter beneath, lanceolate, 5--13 cm. long, 2--3.5 cm. wide, acute at the apex, long-acuminate into the winged petiole at the base, coarsely serrate along the margins except on the basal acumination, glabrous on both surfaces except for a very few scattered minute hairs on the midrib beneath; inflorescence terminal, spicate, solitary, simple, about 41 cm. long; spikes densely many-flowered, erect, rather stout, the rachis very minutely pilosulous, deeply excavated; bractlets lanceolate, about 9 mm. long, long-attenuate at the apex, sparsely ciliolate along the margins, usually rather patent; corolla red, the tube 10—13 mm. long, the limb about 1 cm. wide.

The type of this species was collected by Elias Contreras (no. 1563) in zapotal on the Uxactun trail about 2 km. from the village of Dos Lagunas, El Petén, Guatemala, on October 27, 1960, and is deposited in the C. L. Lundell Herbarium at Renner, Texas.

VERBENA RINCONENSIS Moldenke. sp. nov.

Herba sarmentosis; caulibus gracilibus procumbentibus; ramis gracilibus adscendentibus parce pilosis, pilis albidis; internodiis elongatis; laminis ovatis irregulariter dissectis vel sub-3-lobatis undique parce pilosis; spicis terminalibus abbreviatis longiuscule pedunculatis; bracteolis anguste lanceolatis saepe divaricatis vel recurvatis pilosulis longiter ciliatis.

Creeping herb; stems rooting, slender, mostly procumbent; branches ascending, very slender, rather sparsely pilose with rather stiff & divergent white hairs; principal internodes elongate, 2--9 cm. long; nodes not annulate; leaves decussate-opposite, very variable in size & shape, petiolate; petioles slender, 5—11 mm. long, rather sparsely spreading-pilose with erect whitish hairs, ± margined, especially toward the apex; blades thin-chartaceous, rather uniformly bright-green on both surfaces, ovate, 1.5--3.5 cm. long, 1.5—2.5 cm. wide, irregularly incised, the larger ones 3-lobed, rather sparsely pilose on both surfaces, the lobes & divisions oblong or ovate, mostly acute or subacute at apex; inflorescence terminal, abbreviated, 1.5--5.5 cm. long, subcapitate in anthesis, elongate-cylindric in fruit; peduncles slender, 1--3.5 cm. long, densely white-pilose with wide-spreading rather stiff hairs; bractlets narrow-lanceolate, 4--6 mm. long, mostly divergent or even recurved, attenuate-acute at apex, pilosulous on back, long-ciliate; calyx cylindric, ca. 7 mm. long, rather densely subappressed-pubescent outside, plainly 5-ribbed; teeth 5, subulate, 2 long, 3 short; corolla salverform, tube ca. 8 mm. long, veiny & pilosulous outside toward apex, the limb to 7 mm. wide.

Type, George B. Hinton (no. 8011) from hill at Rincón, dist. Temascaltepec, México, Mexico, August 29, 1935, deposited in herbarium of the Texas Research Foundation, Renner, Texas.

QUERCUS XRIPARIA LAUGHLIN
KANSAS CITY OAK

Hibrida nova[1]

Quercus rubra L. X shumardii schneckii Sarg.

Erythrobalanus Section
Coccineae Series

Kendall Laughlin (1890-)
165 Pine Ave., Chicago, Ill.

A tree 40 cm. in diameter and 20 m. tall with slender horizontal branches and ascending limbs in the crown. Bark dark grayish brown, thin, obscurely ridged, a little warty in the lower portion and quite smooth above. Season's branchlets glabrous, angled, tawny-brown with light lenticels. Terminal winter buds 7 mm. long, pyramidal, compressed, acute, reddish brown, puberulous, with about 6 scales.

Leaf blades 11.5-20 cm. long, 8-15.5 cm. wide, thin, dull moderate yellow green above and slightly paler beneath, glabrous on both sides except for small obscure tufts of rusty hairs in the axils of the pale greenish yellow midrib and the slightly falcate lower primary veins, obovate in peripheral outline, symmetrically divided into 4 pairs of lateral lobes increasing upward in length and separated by elliptic sinuses extending halfway or less to the midrib; the lowest lobes acute and entire; the next lobes acute with or without one or two teeth; the next lobes 2.5-3 cm. broad on well developed leaves and ending in 4 teeth; the uppermost lobes the widest, slightly broadening toward the apex and ending in a 4-5-toothed apex and a lower 2-3-toothed lobule; the terminal lobe up to 10.5 cm. wide, trilobate, divided into 2 sometimes broad 2-4-toothed lateral lobes, the apex 3-5-toothed. Base usually obtuse.

Petioles 2.8-5.6 cm. long, terete, glabrous, greenish yellow.

Acorns solitary or paired, 21-26 mm. long; cup bowl-shaped with an incurved rim, 11-14 mm. high, 18-22 mm. wide, covered with dull grayish brown closely appressed commingled imbricated deltoid puberulous scales, thickened near their apex toward the base of the cup, glabrate inside; nut moderate brown, conspicuously mottled with light gray tomentulum, squarish, 17-20 mm. long and wide, nine-twentieths

enclosed in the cup; peduncle up to 12 mm. long, puberulous.

QUERCUS XRIPARIA LAUGHLIN

Arbor 40 cm. diametro et 20 m. alta cum gracilibus aequis ramis et ascendentibus membris in summo. Cortex fuscus cinereo-brunneus, tenuis, obscure fastigatus, in inferiore paulo verrucosus et supra plane laevis. Novi temporis ramuli glabri, angulati, fulvo-brunnei lucidis lenticellis. Extremae hiemales gemmae 7 mm. longae pyramidatae compressae acutae rufo-brunneae puberulentes, circiter 6 squamis.

Folia 11.5-20 cm. longa, 8-15.5 cm. lata, tenuia, supra hebetia galbina et subtus leviter pallidiora, in ambobus lateribus glabra praeter parvas obscuras cristas rubiginosorum pilorum in axillis pallidae galbinae costae mediae et leviter falcatorum inferiorum nervorum lateralium principalium, circumcurrente adumbratione obovata, concinne divisa in 4 lobos lateralis in utroque latere sublime crescentis longitudine et separatos ellipticis sinibus extendentibus dimidio vel minus ad costam mediam; lobi infimi acuti et integri; lobi proximi acuti cum aut sine uno vel duobus dentibus; lobi proximi 2.5-3 cm. lati in bene passis foliis et finientes 4 dentibus; lobi supremi latissimi leviter dilatantes ad apicem et finientes 4-5-dentato apice et humiliore 2-3-dentato lobulo; lobus extremus tenus 10.5 cm. latus trilobatus divisus in 2 interdum latos 2-4-dentatos lateralis lobos, apice 3-5-dentato. Basis plerumque obtusa.

Petioli 2.8-5.6 cm. longi, rotundi, glabri, galbini.

Glandes solae aut compositae, 21-26 mm. longae; cupula poculoformis incurvato margine, 11-14 mm. alta, 18-22 mm. lata, tecta hebetibus cinereo-brunneis arte adpressis mixtis imbricatis triangulis puberulentibus squamis, prope apicem ad cupulae basim densatis, intus glabrata; nux brunnea, insigniter varia pallido cinereo tomentulo, subquadrata, 17-20 mm. longa lataque, novem-vicesimis conclusa in cupula; pedunculus tenus 12 mm. longus, puberulens.

DISCUSSION

This newly discovered hybrid of the Northern Red Oak rubra L. and the Schneck Oak shumardii schneckii Sarg.,which has a diameter of 16 inches, a circumference of 4 feet 2 inches and a remarkable height of 67 feet, is located in Swope Park, Kansas City, Missouri, U.S.A., at the top of the right, east bank of the Blue

River west of Lakeside Drive at about 70th Street. A Bur Oak 13 feet 2 inches in circumference, the biggest Oak in the park, is 52 feet SSE.

The leaves of riparia display characters of both parents. The dull moderate yellow green upper surface of the leaves of rubra is a distinctive character and this character of riparia together with rather shallow sinuses and an obtuse base could cause riparia to be cursorily regarded as rubra in the field. But the obovate shape of the leaves of riparia and their broad upper lobes and elliptic sinuses are like shumardii. The broad terminal lobe of riparia is unlike either parent and is a thing that has developed in this hybrid complex in Swope Park.

The bowl-shaped acorn-cups of riparia covered with commingled puberulous scales are a distinctive character of schneckii. The nut would be short for schneckii and is flat at the apex instead of rounded.

A winter photograph of a typical schneckii about seven hundred feet northwest of riparia appears on page 414 of Volume 7 of PHYTOLOGIA.

I was fortunate in encountering riparia on September 26, 1962 because it showed distinctive characters of both parents and produced a copious crop of acorns. Probably, however, it is a very rare form of hybrids of the two species.

I have strongly suspected for several years past that numerous trees in Swope Park represent a cross between rubra and the type species shumardii because their leaves do not entirely fit the description of either species even after allowing for variations within each species. Shumardii and its variety are at the northern limit of their range in this locality and hybrids between them and rubra may be expected. The acorns of the different species of Oaks are generally so different that the identity of a hybrid is often clinched by the intermediate or aberrant character of its acorns, by a combination of characters of the parents, or by a combination of a distinctive character of a parent with other characters not possessed by the same species. The acorn-cups of the type species shumardii are typically thicker than rubra; but the acorns of both species undergo a wide range of variations, and after studying many specimens I have become convinced that the acorns of the two cannot be reliably distinguished. Identifying hybrid Oaks without the benefit of fructal evidence is very difficult and more study is needed in this case. What is apparently a common form of this hybrid has lustrous olive green leaves much longer than wide with narrow acute toothed lobes separated by broad open sinuses extending more than halfway to the midrib, falcate lower primary veins, yellow petioles and midribs, a broadly cuneate or obtuse base and insignificant tufts of hairs on the undersurface and deep saucer-shaped acorn-cups with gray scales. These characters are very different from riparia as described above.

The holotype will be deposited in the Royal Botanic Gardens, Kew, England, and an isotype will be deposited in the U.S. National Herbarium, Washington, D.C., by way of the U.S. Forest Service.

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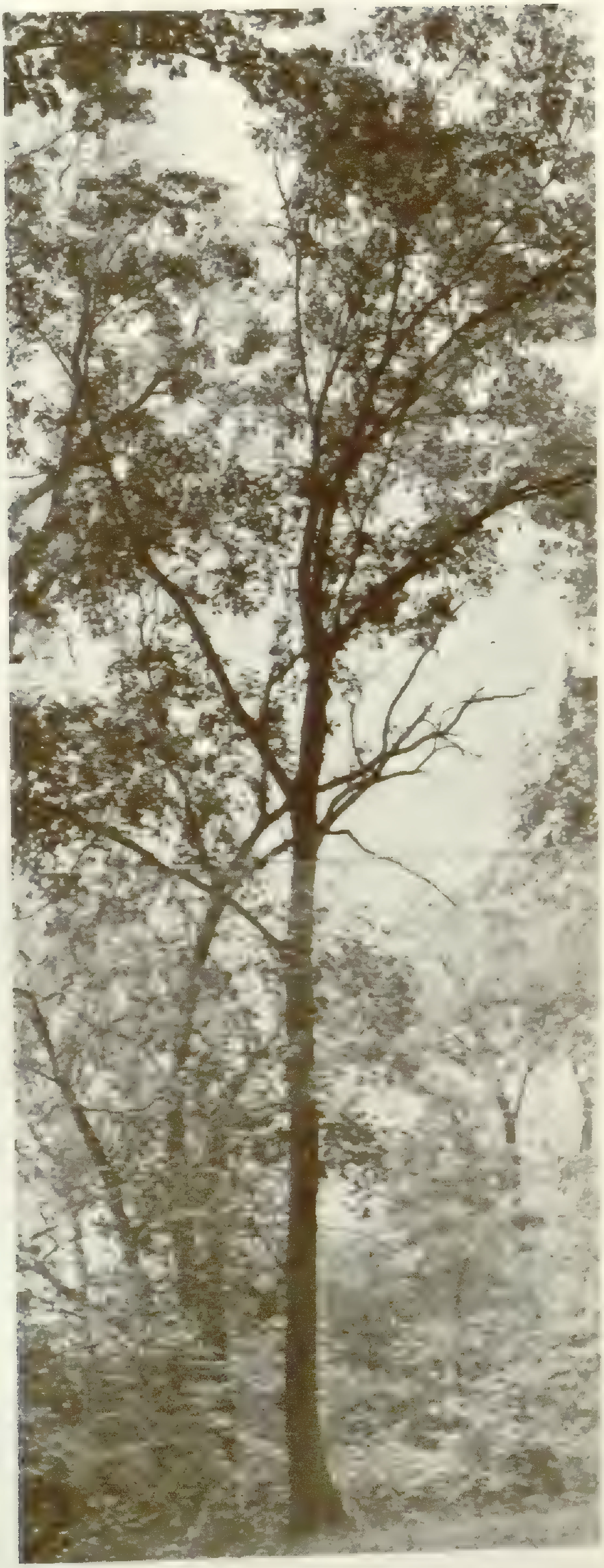
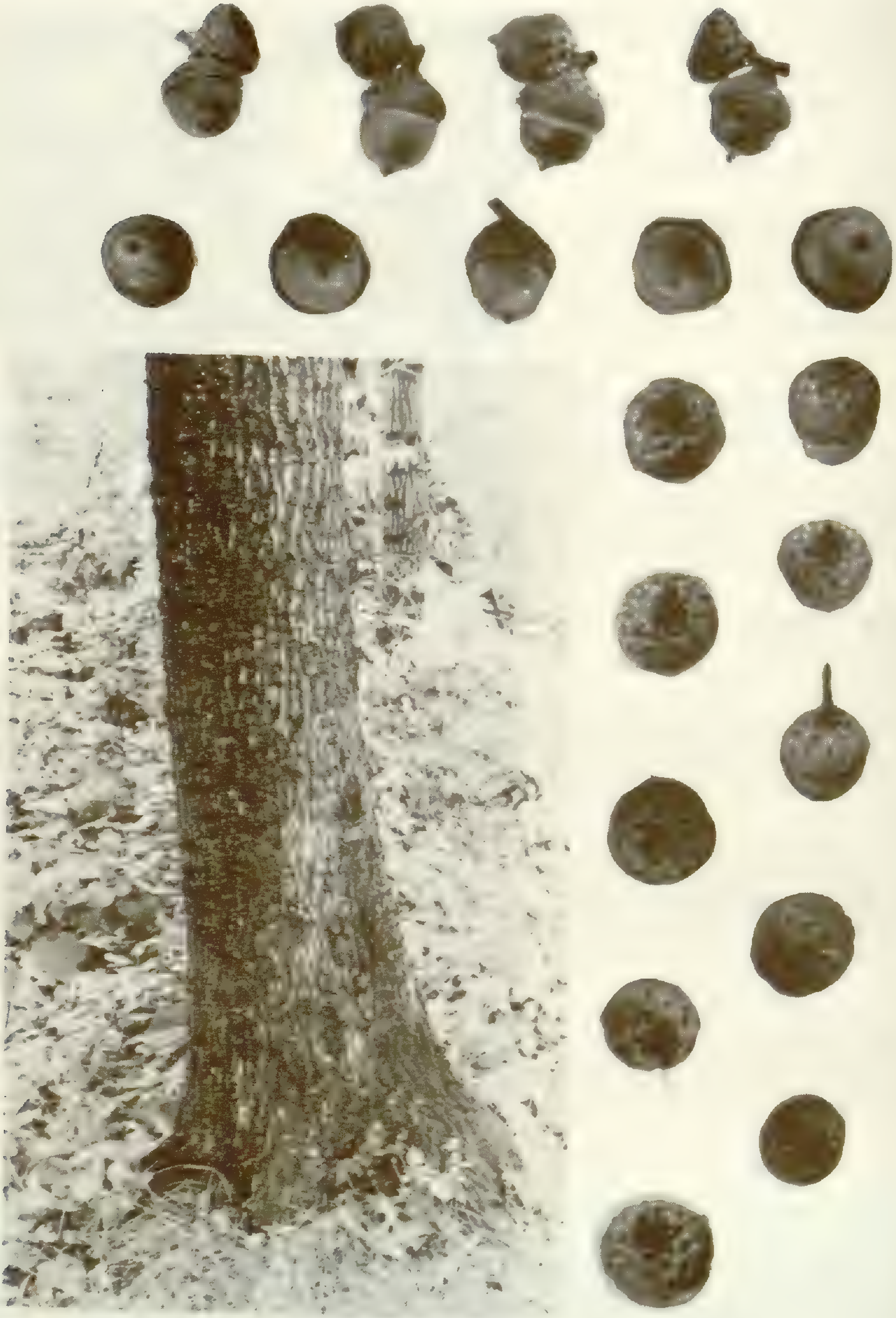
[1] The Gray Herbarium Card Index and Wm. Trelease's "The American Oaks" show "Quercus rubra X shumardii? = Q. joorii Trelease." This "rubra" was the Southern Red Oak, now called falcata.

THE TYPE TREE

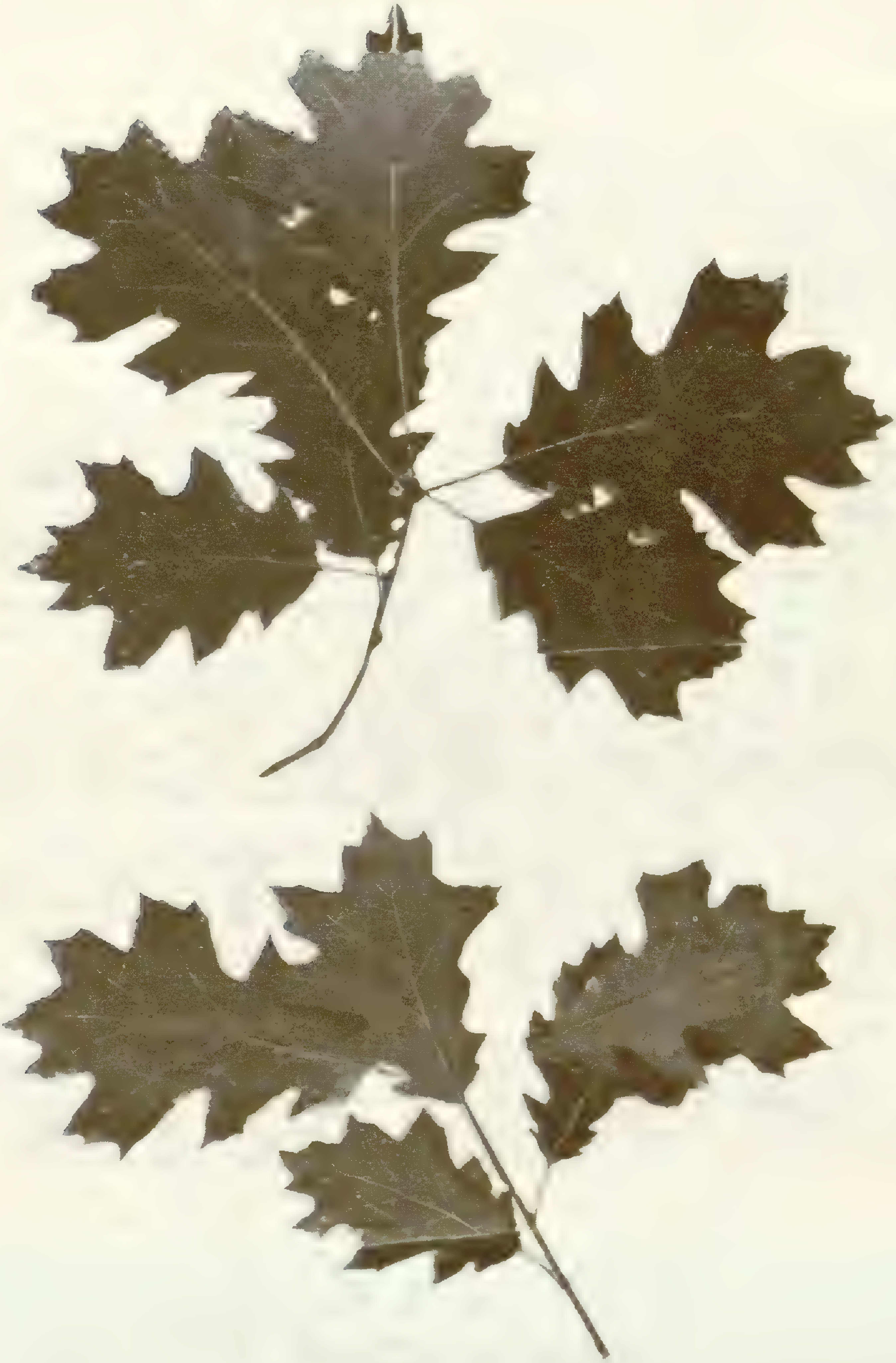
OF

QUERCUS
XRIPARIA





THE TYPE TREE OF QUERCUS XRIPARIA
BARK
ACORNS
53% of natural
size



FOLIAGE OF QUERCUS XRIPARIA

21% of natural size

MALUS LANCIFOLIA REHDER

Kendall Laughlin
165 Pine Ave., Chicago, Ill.

[1]Malus lancifolia Rehder, the Lanceleaf Crab Apple, was originally described in Volume II of C. S. Sargent's "Trees and Shrubs" (1907-13) and was regarded as a distinct species until M. L. Fernald got the idea that it was a variety of coronaria.

Fernald's description of coronaria var. lancifolia in Rhodora 49:232 was sketchy. He did not name a single intergrading character.

Fernald's "description" indicated that he got his information from C. C. Deam. Deam's description of coronaria in the 5th edition of his "Trees of Indiana" is also sketchy. Instead of describing the species in the descriptive text, he writes about Crab Apple thickets, wildlife, poisonous spray and general taxonomic problems. He does not mention lancifolia. The photoengraving on page 210, represented to be coronaria, is actually lancifolia. It is evident that Deam regarded coronaria and lancifolia as conspecific.

The photoengravings in Hough's "Handbook of the Trees of the Northern States" and Harlow's "Trees" and the drawings in Preston's "North American Trees" (the most typical of all) and B&B all show a lobed or lobulate type of leaf for coronaria.

If the two extreme types of leaves--the deeply lobed type shown in Hough's book and the unlobed type shown in Deam's book--are to be regarded as authentic portrayals of the leaf of coronaria, then one would have to conclude that the shape of the leaf means nothing. However, the shape of the leaves is generally shown as a character in keys of Malus.

Lancifolia is not found in Kansas. In its typical form lancifolia is confined to a small area in the western part of Jackson County, Missouri, extending from Courtney thru Independence and over the uplands on both sides of the Blue River to Swope Park and beyond--an area that may be roughly described as the eastern outskirts of Kansas City. I have not explored the Courtney-Independence area but I have studied numerous scattered trees from the Mount Washington Cemetery Woods to Eastwood Hills east of the Blue River and from Blue Valley Park to Swope Park and beyond west of the river. The type material of lancifolia, sent by B. F. Bush to the Arnold Arboretum, was collected in rich woods near Courtney, Bush's home, in 1906. Mention is also made in the original description of a collection taken near Independence.

Coronaria is not found in Jackson County, so that there is no such thing as intergrading. And it is a principle of taxonomy that the characters of the plants in the colony that the type specimen came from should form the description of the species.

Elsewhere in Missouri lancifolia has been found only at Williamsville in Wayne County. Arie F. den Boer has written me that he has never found a single specimen of lancifolia between the Kansas City area and eastern Ohio. It is said that trees referable to lancifolia grow in great numbers in Pennsylvania and Maryland. In the herbarium of the Chicago Natural History Museum there are specimens collected in Fauquier and Shenandoah counties in Virginia.

Lancifolia is one of the best of the Crab Apples because it is very floriferous and has a stout, straight trunk and a well balanced crown. It is much better shaped than coronaria. The A.F.A. champion lancifolia, in Blue Valley Park in Kansas City, has a circumference of 1 foot 10 inches, a height of 25 feet and a spread of 23 feet and produces more than a thousand crab apples a year.

The characters of lancifolia as it grows on the eastern outskirts of Kansas City are so different from the characters of coronaria in the Indiana Dunes State Park, where I have studied it, that I cannot conceive of the two as belonging to the same species. I suspect that the reason why some botanists have concluded, too hastily, that the two are conspecific is that they noted the resemblance between the lobulate type of leaf of lancifolia, which is atypical, and the lobulate type of leaf of coronaria, appearing on old trees, without observing other characters, such as the venation and the ratio of the width to the length.

The Comparative Key at the end of this article shows those characters of the two species that are essentially different. The figure in the "Weight" column reflects my opinion of the relative importance of the character. In ascertaining the identity of a specimen, the figure in this column should be put down in the appropriate specific column whose description matches the specimen's characters: the greater total in either column determines the identity of the specimen.

I have given the greatest weight, 7, to the color of the anthers. The color of the anthers is an important diagnostic character in Crataegus but too little attention has been given to it in Malus. In early May of 1962 I examined the anthers of newly opened flowers of three trees of lancifolia in Blue

Valley Park and one tree just west of Swope Park and found that their color was deep pink. In May of 1960 and 1961 I examined the anthers of fresh flowers of trees of coronaria in the Indiana Dunes State Park and found that their color was orange yellow. These characters are shown in the Key. This is slightly tentative, however. Notes made by Arie F. den Boer on two Eastern trees of lancifolia on file in the Morton Arboretum show the color of the anthers as apricot to deep salmon or buff apricot. If it should develop from studying the anthers of newly opened flowers of numerous wildings correctly identified by other characters that there are several races of either species with differently colored anthers, the Key would have to be corrected accordingly.

I have given the second greatest weight, 6, to the venation of the leaves. This very distinctive character has been overlooked in the past and has apparently been the cause of much of the confusion between the two species.

The lobation and the shape of the base of the leaves are very important but their ecological variations need to be understood. In coronaria in the Indiana Dunes the lowest lobe is conspicuously large except on the largest trees, whose leaves are ovate, rounded at the base and merely lobulate. In lancifolia in the Kansas City area the leaves are unlobed except for a tiny jog in the margin of the leaf at the distal end of the rounded base. However, specimens of lancifolia examined in the herbarium and a plantation of the Morton Arboretum show lobulate leaves.

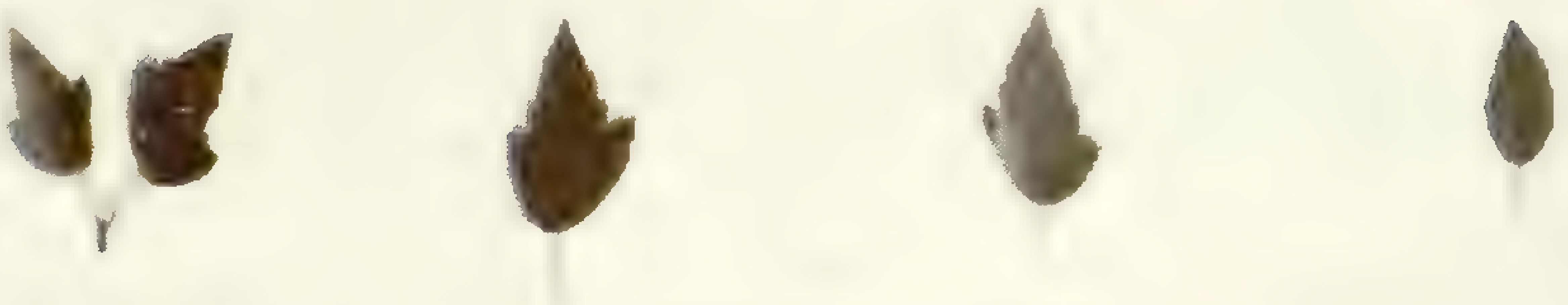
This Key can also be used by persons that prefer to recognize lancifolia as a variety rather than a species.

---

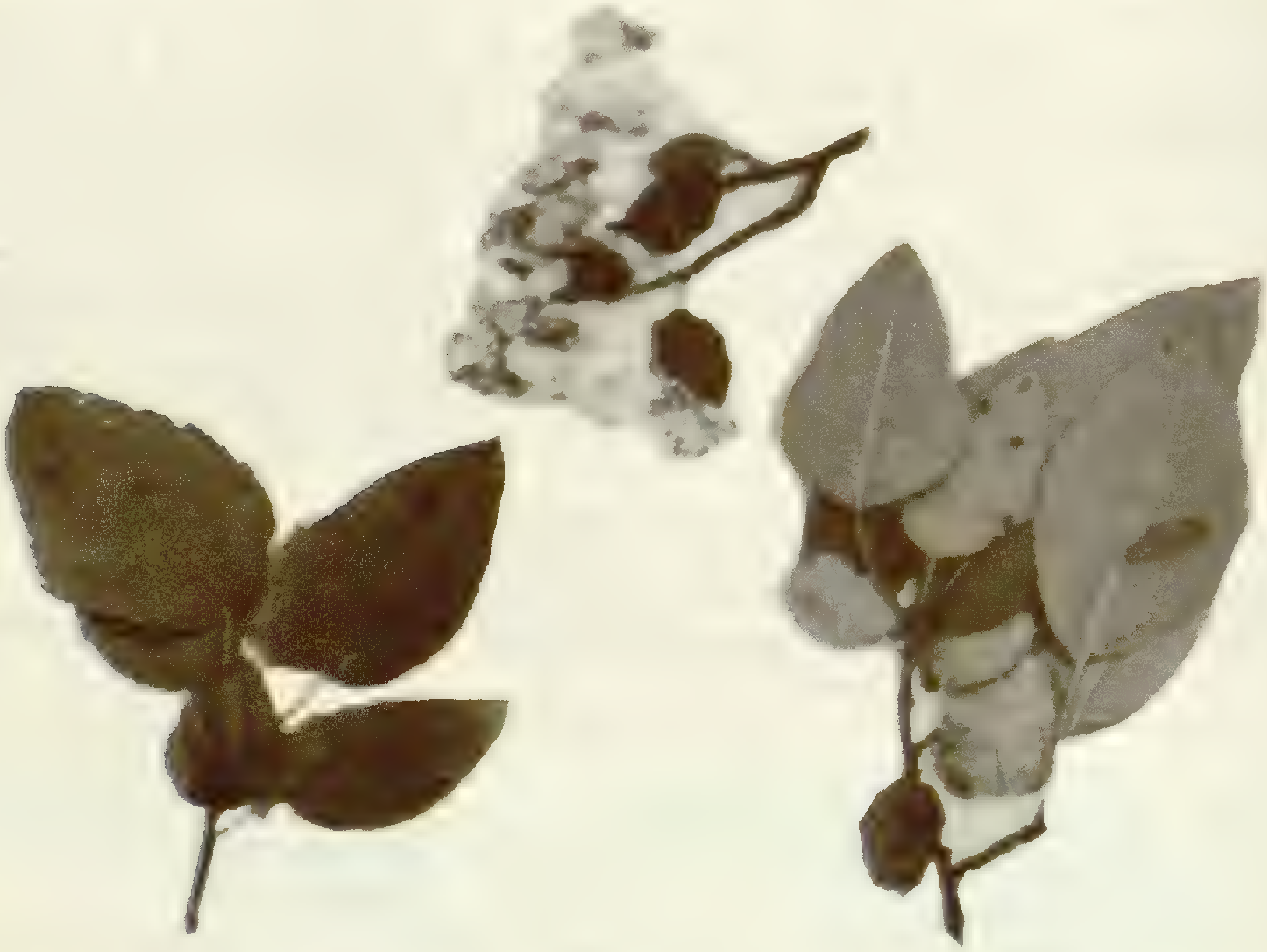
[1] Some botanists use the generic name Malus and others use Pyrus for the Apples and Crab Apples. In most other professions there is a central committee that defines terms, outlines proper procedures and settles disputes and I think it is deplorable that the professional botanical taxonomists do not see the need for uniform understanding.

COMPARATIVE KEY TO MALUS LANCIFOLIA AND MALUS CORONARIA SHOWING THEIR DIFFERENCES

WEIGHT	CHARACTER	MALUS LANCIFOLIA	MALUS CORONARIA
	Leaf Blades:		
4	Base	Rounded, often semicircular.	Often broadly rectilinear-cuneate or nearly so above the narrowly rounded or subcordate base.
1	Lobation	Typically unlobed except for 1 pair of lobes 1-2(-4) mm. wide (measured horizontally but not always present) at the distal end of the rounded base; or sometimes scarcely lobulate.	4-7 pairs of rectangular, pointed, toothed lobes or lobules, the lowest pair usually the largest and appearing at three-eighths to one-half the distance from the base to the apex on lobed leaves.
5	Dimensions	Averaging 52% to 56% as wide as long.	Two-thirds to four-fifths as wide as long.
1	Color above	Moderate yellow green.	Dark greenish yellow or dark yellow.
6	Primary veins	Sometimes arcuate, leaving the midrib at irregular intervals and nearly buried in the parenchyma, usually forking and not reaching the margin of the leaf.	Straight, leaving the midrib at regular intervals and extending to the points of the lobes.
2	Flowers	31-45 mm. wide.	30-32 mm. wide.
7	Anthers	Deep pink.	Orange yellow.
3	Pubescence of lower side of sepals	Glabrous.	Pubescent or hoary-tomentose.
1	Pome	21-28 mm. high, 25-36 mm. wide.	20-23 mm. high, 26-31 mm. wide.



These leaves of MALUS CORONARIA, which are approximately 17% of natural size, were taken from different trees in the Indiana Dunes State Park. Distortion due to the low angle at which the camera was pointed at them causes these leaves to appear to be narrower than they really are. The leaf on the right was taken from the largest tree in the park, 1'11" in circumference, and shows the lobulate type of leaf found on old trees.



These leaves and flowers of MALUS LANCIFOLIA, which are approximately three-eighths of natural size, were taken from the A.F.A. champion in Blue Valley Park, Kansas City, Mo.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS *VERBENA*. XI

Harold N. Moldenke

VERBENA EPHEDROIDES Cham.

Leaves very characteristic, very minute and scale-like, only 1--2 mm. long, acute at the apex, recurved or reflexed, and glabrous, or the lower ones lanceolate, erect, and to 13 mm. long; panicle usually very ample, fastigiate, loose and open; spikes single at the apex of the branchlets or distinctly ternate, pedunculate, 1--2 cm. long, densely flowered, not noticeably elongating after anthesis but sometimes interrupted with a pair of separate flowers at the base, ovate, later narrowly cylindric; pedicels slender, sharply tetragonal, 0.7--3.5 cm. long; bractlets minute, ovate, acute at the apex, 1/3 to 1/2 as long as the calyx, strigillose-canescent; calyx oblong, about 3 mm. long, dark-violet, very obscurely and minutely strigillose-canescent or merely pilosulous, the ribs somewhat prominent, the teeth short-subulate, subequal, in fruit obovate-oblong; corolla-tube scarcely exserted from the calyx, white or else violet from about the middle, noticeably ampliate at the base, very slightly puberulous in the throat, the limb small, violet or lilac to blue, 5-fid, the lobes oblong, truncate or emarginate at the apex; anthers yellowish; fruit about 1.5 mm. long, the cocci narrow, opaque and fuscous-nigrescent on the back, obsoletely striate, the commissural face acute-angled and white-leathery.

The type of this species was collected by Friedrich Sellow somewhere in "Brasilia meridionali" and was deposited in the herbarium of the Botanisches Museum at Berlin (and there, fortunately, photographed by Macbride), but now destroyed. The species is closely related to *V. alata* Sweet and *V. lindmanii* Briq. Common names recorded for it are "jaqueca", "verbena", and "yerba de Santa Ana". It inhabits fields, wet places, and swamps, and has been collected at altitudes of 350 to 1600 meters, in anthesis and fruit in January and November.

Herbarium material of this species has been misidentified and distributed under the names *V. litoralis* Kunth by Widgren, *V. litoralis* L. by Dusén, and *Neosparton ephedroides* Griseb. by Ekman. On the other hand, the *Claude-Joseph 814*, *Hutchison 42*, and *Jörgensen 1403*, distributed as *Verbena ephedroides*, are actually *Diostea scoparia* (Gill. & Hook.) Miers. *Verbena virgata* Ruíz & Pav. is a synonym of *Aloysia virgata* (Ruíz & Pav.) A. L. Juss. The Britton sheet of *Glaziou 17716* bears a supplementary label reading "17713 Minas", but this is apparently an error since Glaziou, in his formal enumeration of his collections, states that his number 17716 was collected by him in São Paulo and does not list a number *17713* for this species at all. He states that it blooms in March and April, and that the flowers are blue. Curiously, he identifies his *no. 17716a* as *V. perennis* Woot., a species not known to occur in South America. The type of V. virgata Sellow is the same as for V. ephedroides; Sellow's herbarium name (cheironym) was discarded by Chamisso because of the earlier homonym of Ruíz & Pavon. The type of V. valerianoides St.-Hil. was collected by Johan Fredrik Widgren (no. 1207) in Minas Gerais, Brazil, on November 4, 1845, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

Briquet (1894) classifies V. ephedroides in his Sect. Verbenaca, Subsect. Junciformes, along with V. alata Sweet, V. sagittalis Cham., Junellia glauca (Gill. & Hook.) Moldenke, J. pseudo-juncea (C. Gay) Moldenke, and J. spathulata (Gill. & Hook.) Moldenke. Walpers (1845) places it in his Sect. Verbenaca, Subsect. Inermes, Group Junceae, along with V. alata and V. sagittalis, Diostea juncea (Gill. & Hook.) Miers and D. scoparia (Gill. & Hook.) Miers, Junellia glauca and J. spathulata, and Neosparton ephedroides Griseb. Schauer (1847, 1851) cites a Bacle s.n. from Montevideo, Uruguay, in either the Berlin or DeCandolle herbarium, not as yet seen by me. He notes "Planta habitu valde insignis".

In all, 17 herbarium specimens and 3 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: BRAZIL: Minas Gerais: Widgren 1207 [4/11/1845] (Br), s.n. [1845] (Br). Paraná: Dusén 11083 (S). Rio Grande do Sul: C. Camargo 62960 (S); Jürgens s.n. [Linha Burity, I.1932] (W--1482199); Rambo 30934 (N). Santa Catarina: F. Müller 90 (Ja--46529); Schwacke s.n. [São Bento, 30/VI/1885] (Ja--46585, Ja, N). São Paulo: Glaziou 17716 (B, N); Schwacke s.n. [Mogy das Cruzes, 19/IV/1889] (Ja--46584). State undetermined: Herb. Mus. Nac. Rio ref. XI (Ja, N); Sellow s.n. [Brasilia meridionali; Macbride photos 17415] (Kr--photo of type, N--photo of type, N--photo of type). ARGENTINA: Misiones: Ekman 2023 (Mi, S).

xVERBENA FABRICATA Moldenke, Phytologia 5: 133. 1955.

Synonymy: Verbena hispida x urticifolia Dermen, Cytologia 7: 170. 1936.

Bibliography: Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 3: 467 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 348--349. 1958; Moldenke, Résumé 223, 366, 377, & 471. 1959.

This is an artificially produced hybrid between V. hispida Ruíz & Pav. and V. urticifolia L., produced by Dermen in a Massachusetts garden. The two parent species do not normally grow together anywhere, so it is not probable that this hybrid will ever be found in the wild. It is not likely to possess any horticultural merit either.

VERBENA FASCICULATA Benth., Bot. Voy. Sulph. 153. 1846.

Synonymy: Verbena matthewsii Briq., Ann. Conserv. & Jard. Bot.

Genèv. 10: 104. 1907. Verbena occidentalis Moldenke, Phytologia 1: 479--480. 1940. Verbena mathewsii Briq., in herb.

Bibliography: Benth., Bot. Voy. Sulph. 153. 1846; Hook. f. & Jacks., Ind. Kew. 2: 1178. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 104. 1907; Prain, Ind. Kew. Suppl. 4: 245. 1913; Moldenke, Phytologia 1: 479--480 (1940) and 1: 511. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35 & 101. 1942; Hill & Salisb., Ind. Kew. Suppl. 10: 242 1947; Moldenke, Phytologia 2: 235. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 71. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73 & 198. 1949; Moldenke, Alph. List Cit. 3: 693, 713, & 766. 1949; Moldenke, Phytologia 3: 286. 1950; Moldenke, Résumé 85, 370, 471, & 472. 1959; Moldenke, Résumé Suppl. 3: 13. 1962.

Tall and vigorous perennial, very hirsute, apparently drought-resistant herb, sometimes 2 feet tall, often rambling over the ground, the stems and leaves with the aspect of Castilleja species; stems robust, often erect, apparently woody at the base, sometimes decumbent, ramose, obtusely 4-angled, spreading-pilose or densely hirsute-pubescent throughout, with some shorter sordid-grayish stipitate glands intermixed, apparently somewhat branched or simple; branches erect or ascending, 15--31 cm. tall, very hirsute; middle cauline internodes 1.5--4 cm. long; leaves decussate-opposite, very short-petiolate or subsessile to plainly sessile, the young ones fasciculate in the axils; petioles, when present, very short and winged; leaf-blades chartaceous, uniformly gray- or ashy-green on both surfaces, about 4 cm. long, softly spreading-pilose or densely hirsutulous-pubescent on both surfaces with grayish hairs like those on the stems, sometimes substrigose above, deeply 3--5-parted or -dissected to the base in an almost verticillate fashion, the segments rather deeply incised-crenate or pinnatifid, scarcely 0.5 mm. wide, the primary incisions to 3.5--5 cm. long, the lobules about 4 mm. wide, obtuse or subobtuse, somewhat revolute along the margins, the rest smaller and much narrower, lanceolate or linear, acute, entire or 3--5-fid; midrib and secondaries very slender, impressed above, prominulous beneath; veinlet reticulation indiscernible on both surfaces or prominulous beneath; spikes terminal, single, simple, sessile or short-pedunculate, unbranched, 7--8 cm. long, elongate during anthesis, very densely many-flowered, the floriferous part about 2.5 cm. long and 1.5 cm. wide, shorter than in V. canadensis but otherwise similar; peduncles slender, about 3.5 cm. long, densely hirsute-pubescent like the stems; flowers sweet-smelling, very densely imbricate (except the lowest 2 or 3, which may be arranged in a whorl somewhat separated from the rest of the spike) or more separated so as to be barely imbricate and somewhat divergent in fruit; bractlets large, linear to narrow-lanceolate or lanceolate-subulate, 5--8 mm. long, less than 1 mm. wide, acuminate at the apex, equaling or somewhat surpassing the calyx during anthesis, densely hirsutulous with gland-tipped hairs like the peduncles or antrorsely pilose, similar to those of

V. canadensis; calyx oblong-elongate or tubular, 7--8 mm. long and 2 mm. wide during anthesis, similar to that of V. canadensis, its tube about 5 mm. long, 5-costate, 5-angled, hirtous or densely hirsutulous to antrorsely pubescent, with small, spreading, whitish glands intermixed among the hairs, very thin-textured between the ribs, its rim 5-apiculate, the teeth lanceolate-acuminate or setaceous, about 2 mm. long; corolla hypocrateriform, varying from lavender or purple to deep- or dark-purple, smaller than that of V. canadensis, its tube about 10 mm. long, surpassing the calyx-teeth by 2--3 mm., the limb medium-sized, about 5 mm. wide, puberulent on the outer surface, the lobes obovate-truncatulate, subemarginate; stamens and pistil barely equaling the mouth of the corolla-tube; anther-glands small; anther-cells distinct, rather broad; upper lobe of the style very short, thickly pulvinate-stigmatic, the lower short but surpassing the pulvinus, incurved-acute, naked; cocci oblong, splitting spontaneously at maturity, rugose above with an elevated reticulation of veins; testa very slender, membranous; endosperm very sparse, but apparently present.

The type of this species was collected at Huamantango, Lima, Peru, and has not as yet been seen by me. It is preserved in the herbarium of the Royal Botanic Gardens at Kew. However, my good friend, Edgar Milne-Redhead, in a letter to me dated February 12, 1963, asserts that "We find that we cannot distinguish V. mathewsii Briq. from V. fasciculata Bth., and regard it as a taxonomic synonym. The type locality of both was in the same region of Huarochiri." Bentham notes that the species is related to V. canadensis (L.) Britton, but is more hirsute and has different leaves. He says that it is perhaps suffruticose and that Cuming 954, from the coast of Peru, seems to be the same species, with rather blunter lobes to the leaves.

The type of V. occidentalis was collected by Andrew Mathews (no. 498) somewhere in Peru in 1834, and is deposited in the Meisner Herbarium at the New York Botanical Garden, while that of V. matthewsii is given by Briquet as "no. 495" from the environs of Lima, Peru, deposited in the Delessert Herbarium at Geneva. It is also given as "495" on the labels of Macbride's photograph of the type specimen, but this appears to be an error in reading in both cases. The original specimen seems to be a part of the same 498 collection. Also, the collector's surname should be spelled with a single "t" according to the late Dr. J. H. Barnhart. Most of the records in botanical literature concerning this man spell the name with one "t", including the Kew list of collectors, the British Museum list of collectors, the list of British and Irish botanists, the London catalogue of scientific literature, and his own writings in the publications of the Horticultural Society. Only the Linnean Society and one Journal of Botany obituary spell the name with a double "t", and there his first name is given as "Alexander" instead of "Andrew".

The species has been found in dry clay or clayey soil, sandy loam, stony habitats, hot and dry rocky hillsides, and puna, from 550 to 3900 meters altitude, flowering from February to April and in October and December. Herbarium material has been misidentified and distributed as V. laciniata (L.) Briq. Tovar 1351 is said by the collector to have had whitish flowers and may therefore represent a color form worthy of special designation.

Briquet says "Espèce voisine des V. clavata Ruiz et Pav., V. sulfurea Sweet, V. Berterii Schau., V. lipozygioides Walp. etc. Toutes ces espèces ont des tiges procumbantes, sortant d'un rhizome ou d'une base ligneuse et ont un port complètement différent. Toutes aussi ont des bractées bien plus courtes que le calice. Le V. clavata Ruiz et Pav., qui par la longueur des bractées se rapprocherait du V. Matthewsii, possede des feuilles entièrement tripartites a segments lineares pseudo-verticilles, des apis sessiles involucres, des appendices antheriens saillants, des lobes corollins lineares-oblongs, caractères qui permettent facilement de l'en distinguer."

In all, 13 herbarium specimens, including the type collections of three of the names involved, and 2 mounted photographs have been examined by me.

Citations: PERU: Ancash: Ferreyra & Cerrate 12191 (Ok). Ayacucho: R. Ferreyra 5470 (N, Ug). Cajamarca: Stork & Horton 10032 (Ca--639346). Huancavelica: Tovar 1351 (Z). Lima: R. Ferreyra 1980 (N); Mathews 498 ["495"; Macbride photos 24691] (Kr--photo, M, N--photo); S. G. E. Saunders 797 (S), 799 (S); Stork & Vargas 9341 (Ca--647436). Loreto: Née 99 (Q). Province undetermined: Mathews s.n. [in Peruvia interiore, 1862] (M); Née 98 (Q).

xVERBENA FECUNDA Moldenke, Am. Midl. Nat. 59: 349. 1958.

Synonymy: Verbena canadensis x ambrosifolia f. eglandulosa Dermen, Cytologia 7: 168, in textu. 1936; Moldenke, Résumé 360, in syn. 1959. Verbena canadensis var. atroviolacea x ambrosifolia f. eglandulosa Dermen, Cytologia 7: 168, in textu. 1936; Moldenke, Résumé 360, in syn. 1959. Verbena canadensis var. compacta x ambrosifolia f. eglandulosa Dermen, Cytologia 7: 168, in textu. 1936; Moldenke, Résumé 360, in syn. 1959. Verbena canadensis var. compacta Hort. x V.ambrosifolia f. eglandulosa Dermen ex Moldenke, Résumé 421, in nota. 1959.

Bibliography: Dermen, Cytologia 7: 168. 1936; Moldenke, Am. Midl. Nat. 59: 349. July 1958; Moldenke, Phytologia 6: 330. August 1958; Moldenke, Résumé 359, 360, 421, & 471. 1959; Moldenke, Résumé Suppl. 1: 15 (1959) and 3: 37. 1962.

Under this name are included the fertile hybrids produced artificially in Massachusetts by Dermen between V. canadensis (L.) Britton [including V. canadensis var. atroviolacea Hort. and V. canadensis var. compacta Hort.] and V. ambrosifolia f. eglandulosa Perry. These two parental taxa apparently grow together in at least two counties of Texas, so it is possible that the hybrid will be found in the wild state. It should have horticultural merit and deserves further study.

xVERBENA FERAX Moldenke, Am. Midl. Nat. 59: 349. 1958.

Synonymy: *Verbena canadensis* x *racemosa* Dermen, Cytologia 7: 168. 1936. *Verbena canadensis* var. *atroviolacea* x *racemosa* Dermen, Cytologia 7: 168. 1936. *Verbena canadensis* var. *compacta* x *racemosa* Dermen, Cytologia 7: 168. 1936.

Bibliography: Dermen, Cytologia 7: 168. 1936; Moldenke, Am. Midl. Nat. 59: 349. July 1958; Moldenke, Phytologia 6: 330. August 1958; Moldenke, Résumé 360, 373, & 471. 1959; Moldenke, Résumé Suppl. 1: 15. 1959.

Under this name are included the fertile hybrids produced artificially in Massachusetts by Dermen between *V. canadensis* (L.) Britton [including *V. canadensis* var. *atroviolacea* Hort. and *V. canadensis* var. *compacta* Hort.] and *V. racemosa* Eggert. These two species apparently grow together in at least two counties of Texas, so there is a distinct possibility that the hybrid may be found in the wild state. It may have horticultural merit and deserves further study.

VERBENA FERREYRAE Moldenke, Phytologia 3: 279. 1950.

Bibliography: Moldenke, Phytologia 3: 279 & 286. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 85 & 471. 1959.

Herb; stems and branches erect or ascending, obtusely tetragonal, brunnescent in drying, rather sparsely puberulent with weak, irregular, whitish hairs, the former rather stoutish, the latter quite slender; nodes annulate; principal internodes 2--6.3 cm. long; leaves decussate-opposite, sessile, uniformly bright-green on both surfaces, the immature ones often brunnescent in drying, 3-parted almost to the base, 3--6 cm. long and wide, the 3 divisions again pinnately parted and incised, the lobes rather thick and acute, the segments irregular in diameter, usually increasing in diameter toward the leaf-base and there often to 8 mm. wide, revolute-margined, rather sparsely puberulent-pilosulous above, becoming glabrescent in age, more densely puberulent beneath, the single vein in each segment mostly subimpressed above and prominulous beneath, extending to the apex of each lobe; inflorescence terminal, that at the apex of the main stems usually ternate, spicate, densely many-flowered; peduncles slender, 1.5--4 cm. long, densely short-pubescent with reflexed whitish hairs; floriferous portion of the inflorescence usually conic before anthesis, capitate during anthesis, and elongate to 4 cm. or more after anthesis, very dense; bractlets oblong-linear, 6--8 mm. long, rather densely puberulent; calyx tubular, about 6 mm. long, 5-costate, rather densely short-pubescent, its rim 5-apiculate; corolla hypocrateriform, sky-blue, its tube about 8 mm. long, the limb about 9 mm. in diameter, densely pilose in the throat.

The type of this species was collected by my good friend and colleague, Dr. Ramón Ferreyra (*no. 5491*) -- in whose honor it is named -- in a stony habitat, at 3200 to 3300 meters altitude, above Puquio, in the province of Lucanas, Ayacucho, Peru, on March 19, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is known so far only from the type collection, and 2 herbarium specimens, including the type, have been examined by me.

Citations: PERU: Ayacucho: *R. Ferreyra 5491* (N--type, Ug--isotype).

VERBENA FILICAULIS Schau. in A. DC., Prodr. 11: 549. 1847.

Synonymy: *Verbena pinnatisecta* Schau. in A. DC., Prodr. 11: 549. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 549 & 556. 1847; Schau. in Mart., Fl. Bras. 9: 192. 1851; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks., Ind. Kew. 2: 1178. 1895; Hayek, Denkschr. Kaiser. Akad. Wiss. Math.-nat. 79 (1): 294. 1908; Herter, Florul. Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 44, & 101. 1942; Moldenke, Lilloa 10: 384. 1944; Augusto, Fl. Rio Grande do Sul 212. 1946; Moldenke, Alph. List Cit. 1: 56, 166, & 177. 1946; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 2: 363, 364, 366, 367, 375, 534, 550, 551, & 598 (1948), 3: 670, 675, 686, 688, 751, 814, 846, 863, 920, & 923 (1949), and 4: 1081, 1097, 1123, 1124, 1180, 1222, 1249, & 1250. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 106, & 198. 1949; Moldenke, Phytologia 3: 288. 1950; Stellfeld, Trib. Farmac. 19 (10): 166 & 167. 1951; Rambo, Sellowia 7: 260. 1956; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 110, 127, 372, & 471. 1959; Angely, Fl. Paran. 16: 78 (1960) and 61: 46. 1961.

Mostly procumbent herb, smooth and glabrous or strigillose-scabrous throughout; rhizome creeping, giving rise to numerous stems; stems herbaceous, strict, often ascending from the base and 30--40 cm. long, filiform, often weak or flaccid, subsimple, tetragonal or subtetragonal; principal internodes longer or shorter than the leaves; petioles elongate, slender, canaliculate, submargined, the lower ones 1.6--2 cm. long, the upper ones slightly shorter; leaf-blades thick-textured, diminishing in size upwards, 3-partite, pinnatifid-laciniate, shiny above, dark beneath, the segments cuneate-attenuate at the base, the venation impressed above, prominent beneath, the lowermost lobes cuneately narrowed at the base into the petiole, about 1.2 cm. long, the lateral lobes subspatulate-linear or narrowly lanceolate, acute or rather obtuse at the apex, entire or bifid, subrevolute or revolute along the margins, the central lobe trifid; inflorescence terminal and lateral, the spikes pedunculate or long-pedunculate, the terminal ones single and simple or ternate, the lateral ones again ternate or ternate-corymbose, cylindric-oblong, loose-flowered or imbricate, not very many-flowered, eventually to 4 cm. long, interrupted at the base, finally with scattered flowers; bractlets ovate, concave, about half as long as the calyx, acute at the apex, obsoletely ciliate; calyx short, tubular, about 3 mm. long, subcostate, the rim short-dentate, very finely ciliate, the teeth broadly triangular and acute or apiculate at the apex; corolla varying from blue or red-blue to violet, lilac, or red, glabrous on the outside, its tube somewhat surpassing the calyx, the throat closed by dense barbate hairs, the limb velutinous, lanuginous in the center; stamens inserted in the upper part of the corolla-tube; filaments very short; anthers muticous, the connective of the upper ones hardly thickened; style scarcely surpassing the calyx, incrassate above; stigma subterminal, forming a very short lateral capitate beak; fruit subequaling and included by the fruiting-calyx, about 3 mm. long; cocci terete, fuscous, obsoletely striate on the dorsal surface and areolate at the apex, the commissural face whitish-leathery.

V. pinnatisecta is based on a collection made by Ludwig Riedel in wet swampy places at or near Mugy das Cruces, São Paulo, Brazil, and one made by Friedrich Sellow (*no. 20*) probably in Minas Gerais, Brazil, while *V. filicaulis* was based on a collection made by Peter Wilhelm Lund (*no. 823*) in São Paulo, one by Sellow (*no. 28*) in Minas Gerais, and one by Johan Lhotsky ["Khotsky" according to Schauer] in Minas Gerais. Schauer distinguishes the two by saying for *V. filicaulis*: "Proxima V. pinnatisectae, potissimum teneritate partium, scilicet caulibus debilibus foliisque minus dissecta laciniis angustioribus, diversa." Personally, I think that they are conspecific. Schauer also suggests that his *V. pinnatisecta* might be the same as *V. crithmifolia* Gill. & Hook. ["quae vero ex descr. differt foliorum laciniis angustioribus linearibus, bracteis linearibus, calycis dentibus obtusiusculis et corolla calyce duplo longiore"] and that his *V. filicaulis* might be the same as *V. crithmifolia* β *minor* Gill. & Hook. [=*V. hookeriana* (Covas & Schnack) Moldenke], which he apparently knew only from the descriptions. These species, however, as all very distinct from that of Schauer.

Verbena filicaulis has been collected in swamps and swampy places, wet grassy campos, bogs, and meadows, on often inundated riverbanks, in fields and bare soil along railroad tracks, and in pinewoods with *Butia*, at altitudes of 90 to 1400 meters, flowering in May and August to January. Briquet (1894) places it in his Sect. *Verbenaca*, Subsect. *Leptostachyae*. Hoehne says of it "planta meio rasteira" and Pickel says "em solo humido da represa". What Schauer means by his "caules....lateralibus foliis alternis subexcavatis, foliis subjectis planiusculis submarginatis et subliter striatis" is not certain. Herbarium material has been misidentified and distributed as *V. tenuisecta* Briq. On the other hand, the *Dusén 7108*, distributed as *V. pinnatisecta*, is the type collection of *V. dusenii* Moldenke.

Hayek (1908) cites *Wettstein & Schiffner s.n.* [Butantan, V. 1901] and *s.n.* [Tieté, VIII.1901] from São Paulo, while Stellfeld

(1951) cites two additional Tessman and one Stellfeld collections from Paraná -- Herb. Mus. Paran. 2232, 2447, and 2527. Macbride photograph 17439, cited below, is of a specimen deposited in the Berlin herbarium, now destroyed.

In all, 67 herbarium specimens and 9 photographs, including type or phototype material of both names involved, have been examined by me.

Citations: BRAZIL: Minas Gerais: Henschen s.n. [Caldas, 23/10/1868] (W--209655); Mosén 969 (N, S); Regnell II.211 [17/11/1866] (N), II.211 [Caldas, Oct. 23, 1868] (N, S); Sellow 20 [Macbride photos 17439] (Kr--photo, Kr--photo, N--photo, N--photo, N--photo), 28 (N--cotype, N--photo of cotype, Ut--cotype, Z--photo of cotype); Widgren 870 [1845] (W--1323092), 1210 (Br), s.n. [1845] (Br, Ja--46590, N, S), s.n. [Brasilia] (S, S). Paraná: Dusén 7106 (S, S), 15679 (Ca--501671, N, S, S, W--1481764); Hatschbach 2561 (N), 2672 (N); Jönsson 1392a (N, S, W--1481765); Smith, Reitz, & Caldato 9568 (Ok, W--2251567); Tessman s.n. [Herb. Mus. Paran. 3395] (N). Rio Grande do Sul: Rambo 35413 (N), 36413 (S), 54571 (B), 57237 (S). Santa Catarina: F. Müller 94 (Ja--46532); Reitz & Klein 7711 (Mm), 7738 [Herb. Barb. Rodr. 22662] (Mm, N, S); Smith & Klein 11041 (N, Ok, W--2251746), 11404 (Ok, W--2251778); Smith & Reitz 9122 (Ok, W--2251493); Smith, Reitz, & Sufridini 9544 (W-2251563, Z); Ule 1536 [Herb. Osten 13014] (Ug). São Paulo: Brade 5738 (Ja--22884, S, Sp--6726); C. Duarte 196 (N, Sp--15723); Edwall s.n. [Agua Branca, Aug. 5, 1895; Herb. Com. Geogr. & Geol. 3127] (Sp--15718); F. C. Hoehne s.n. [Butantan, Sept. 15, 1917] (N, N, Sp--543); W. Hoehne 527 (N); Löfgren s.n. [Pinheiros, Nov. 2, 1893; Herb. Com. Geogr. & Geol. 1560] (N, Sp--15713); Lund 823 [Macbride photos 7854] (Kr--photo of cotype, N--photo of cotype); Pickel 1759 (N, Sf); Usteri s.n. [Tieté, 1905] (N, Sp--15735). ARGENTINA: Misiones: D. Rodriguez 570 [Herb. Inst. Miguel Lillo 31548] (N).

VERBENA FLAVA Gill. & Hook. in Hook., Bot. Misc. 1: 170. 1830.

Synonymy: Verbena flava Gill. ex Reiche, Fl. Chile 5: 463. 1910. Glandularia flava (Gill. & Hook.) Schnack & Covas, Darwiniana 6: 475. 1944.

Bibliography: Hook., Bot. Misc. 1: 170. 1830; Walp., Repert. Syst. Bot. 4: 30. 1845; Schau. in A. DC., Prodr. 11: 555. 1847; Jacks., Ind. Kew. 2: 1178. 1895; Speg., Rev. Agron. La Plata 3: 563. 1897; Kuntze, Rev. Gen. Pl. 3 (2): 255. 1898; Reiche, Fl. Chile 5: 295 & 463. 1910; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1913; Hicken, Physis 2: 114. 1916; Sanzin, Anal. Soc. Cient. Argent. 88: 97, 98, 124--127, & 134. 1919; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Schnack & Covas, Darwiniana 6: 471, 473, & 475 (1944) and 7: 71, 72, 74, & 75, pl. 4. 1945; Schnack & Covas, Revist. Argent. Agron. 12: 222. 1945; Ind.

Taxon. 1 (14--16): 6. 1945; Cabrera, Bol. Arg. Soc. Bot. 1: 67. 1945; Moldenke, Alph. List Cit. 1: 93 & 202. 1946; Moldenke, Phytologia 2: 338. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 10 & 24. 1947; Moldenke, Alph. List Cit. 3: 881. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Résumé 127, 296, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 14. 1962.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. 88: 126. 1919; Schnack & Covas, Darwiniana 7: pl. 4. 1945.

Stems procumbent at the base; leaves linear-lanceolate, entire, pinnatifid, glabrous, the segments few, linear, trifid, entire; flowers loosely spicate; calyx elongate, pubescent, the teeth very unequal; bractlets minute; corolla yellow or pale-yellow to rose, glutinous; chromosome number: 2n = 10.

This Andean species was based on two collections made by John Gillies in the Andean valleys near Mendoza and on the hills at Rio del Diamente, Mendoza, Argentina. Walpers (1845) places it in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia, with ten other species. It has been collected in sandy places at altitudes of 250 to 1600 meters, flowering from November to May and in September, fruiting in November. Sanzin reports it as "common on Pampa San Rafael". Hicken (1916) reports it from Neuquen. Herbarium material has been misidentified and distributed as V. glutinosa Kuntze. On the other hand, the H. H. Bartlett 19410, distributed as V. flava, is actually V. chilensis Moldenke. Ruiz Leal 13088 bears a notation to the effect that the flowers vary from "yellow to rose", perhaps due to age. In all, 22 herbarium specimens have been examined by me.

Citations: ARGENTINA: Chubut: Graetel s.n. (Br). Mendoza: Carette 339, in part (N), s.n. [Ruiz Leal 2558] (N); Ruiz Leal 6913 (N), 7093b (N), 7117 (N), 7349 (N), 8503 (N), 8960 (N),9291 (N, N), 9790 (N), 13088 (Z); Sanzin 3104 [Herb. Osten 15637] (Ug). Río Negro: W. Fischer 59 (Cm, N, Ur, W--704229, W--704230). Province undetermined: Kuntze s.n. [Pampas Reise 35° I.92] (N, W-701714, W--701715).

VERBENA FLAVA var. ANGUSTILOBA Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902.

Synonymy: Verbena flava angustiloba Speg. ex Moldenke, Résumé 364, in syn. 1959.

Bibliography: Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1913; Sanzin, Anal. Soc. Cient. Argent. 88: 127. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101 (1942) and [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127, 364, & 471. 1959.

This variety differs from the typical form of the species in having its branches elongate and slender, the lower leaves tripartite with linear segments, the upper ones entire, with elongate narrowly linear segments, the corolla yellow, its throat glabrous, and the anther-glands dark-purple and exserted.

The type of the variety was collected by Carlo Luigi Spegazzini in dry places along the Río Negro at El Carbon near Carmen de Patagones, Río Negro, Argentina, during the summer of 1897 to 1898. Hauman-Merck (1913) cites a Garbers specimen from Choele-Choel, Río Negro [Hauman-Merck 343]. The variety is known to me only from literature.

VERBENA FLAVA var. LATILOBA Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902.

Synonymy: Verbena flava latiloba Speg. ex Moldenke, Résumé 364, in syn. 1959.

Bibliography: Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902; Hicken, Physis 1: [Canist. Neuquen.] 127. 1912; Sanzin, Anal. Soc. Cient. Argent. 88: 127. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101 (1942) and [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 14. 1962.

This variety differs from the typical form of the species in having the leaves completely glabrous, rather thickly membranous, green or slightly subglaucescent, and all 3-parted or trifid, with ovate lobes, the flowers yellow, the throat glabrous, and the two anther-glands large, dark-purple, and quite conspicuous.

The variety is based on two collections, one made by Nicolás Illin and the other by J. Kozlowsky, in the dry pre-Andean region in Chubut, Argentina, in the summer of 1899 to 1900. Hicken (1912) says of the variety "Frecuente cerca de los arroyos. Cordilleras del Chub." It is known to me only from literature.

VERBENA FLAVA var. LATILOBA f. ABORTIVA Hicken, Sert. And. 65. 1923.

Bibliography: Hicken, Sert. And. 65. 1923; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101 (1942) and [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127 & 471. 1959.

This form differs from the typical form of the variety in having its anther-glands very minute, not at all conspicuous. The leaves are almost all pinnatifid, rarely with a few entire ones interspersed above.

The type of the form was collected by Cristóbal María Hicken (no. 135) at Arroyo Morro, on the Río Diamente, at an altitude of 2000 meters, Mendoza, Argentina, in December, 1912. The collector says "Las glandulás abortan y se presentan como un pequeñísmo apéndice dorsal a las anteras, muy difícil de ver, y que podría por esta causa pasar desapercibido y hacer creer en una planta del grupo de Verbenaca. Las hojas casi todas son pinatífidas y er raro incontrar una u otra hoja pecueña sencilla en las partes superiores de los tallos." The form is known to me only from literature.

VERBENA GALAPAGOSENSIS Moldenke, Phytologia 2: 55. 1941.

Bibliography: Moldenke, Phytologia 2: 55. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 101. 1942; Moldenke, Castanea 13: 116. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 198. 1949; Moldenke, Alph. List Cit. 3: 972. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 81 & 471. 1959.

Herb, nigrescent throughout in drying; stems and branches slender, acutely tetragonal, often sulcate and striate between the angles, very sparsely pilose with short whitish widely scattered antrorse hairs; nodes annulate; principal internodes 1--5.8 cm. long; leaves decussate-opposite, sessile, sub-clasping at the base, linear or very narrowly lanceolate, 5--15 mm. long, rather abundantly pilose with appressed antrorse hairs on both surfaces; midrib and veinlet reticulation indiscernible; inflorescence terminal, spicate, 4--15 cm. long, loosely many-flowered; peduncles slender, similar to the branches in all respects, nigrescent in drying, acutely tetragonal, longitudinally striate, very sparsely scattered-pilose, 1--3 cm. long; bractlets ovate-lanceolate, about 2.5 cm. long, ciliolate-margined, acuminate at the apex, usually glabrate or very obscurely pilosulous except for the margins; mature flowers and fruit not known.

The type of this remarkable species was collected by Alban Stewart (*no. 3318*) at Cowley Bay, Albemarle Island, in the Galapagos Islands, on August 10, 1905, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector states that the species is common at 2000 feet elevation and fairly abundant "inside 2750 feet", apparently flowering and fruiting in August, although the material collected is not sufficient to enable accurate description of these parts. It has been confused in the past with *V. litoralis* H.B.K. In all, 6 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Albemarle: *A. Stewart 3318* (Bi--isotype, F--photo of isotype, Gg--31374--isotype, N--type, N--photo of isotype, Si--photo of isotype, Z--photo of isotype), *3319* (Bi, Gg--31373, W--921598).

VERBENA GENTRYI Moldenke, Phytologia 2: 27. 1941.

Bibliography: Moldenke, Phytologia 2: 27. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101. 1942; Moldenke, Alph. List Cit. 1: 233. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 198. 1949; Moldenke, Alph. List Cit. 4: 1246. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 39 & 471. 1959.

Low spreading bush, branched from the base; branches rather slender, tetragonal, often purplish, very sparsely scattered-pilose with rather long weak hairs or glabrous; nodes annulate; principal internodes 1--3.5 cm. long; leaves decussate-opposite; petioles indistinct, to 5 mm. long, winged, ampliate and clasping the stem at their base, sparsely scattered-pilose or glabrescent, or absent; leaf-blades chartaceous, lighter beneath, elliptic, 3-7 cm. long, 1--1.7 cm. wide, acute at the apex, cuneate at the base and prolonged into the winged petiole, regularly sharp-serrate from the apex to below the middle, rather abundantly appressed-strigillose on both surfaces, more densely so beneath, not scabrous above, not glandular; venation slightly subimpressed above, prominulous beneath; inflorescence spicate, compound, the spikes very slender, to 19 or more cm. long, many-flowered, the flowers closely imbricate before and during anthesis, rather uniformly separated in fruit; peduncles 1--3 cm. long, slender, glabrate; rachis slender, glabrate; bractlets lanceolate, very small, about 1--2 mm. long, sharply acuminate at the apex, subglabrate or very minutely ciliolate at the base; calyx narrow-tubular, about 1.5 mm. long, glabrous or subglabrate; corolla very tiny; fruiting-calyx to 2 mm. long.

The type of this species was collected by Howard Scott Gentry (*no. 5923*) -- in whose honor it is named -- in a moist canyon bottom in the Short-tree Forest zone, at an altitude of 1500 feet, in the Sierra Monterey, Sinaloa, Mexico, on March 13, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was distributed by the collector as *V. urticifolia* L., to which it is related. Thus far it is known only from the type collection. In all, 6 herbarium specimens, including the type, have been examined by me.

Citations: MEXICO: Sinaloa: *H. S. Gentry 5923* (Ca--651815--isotype, Du--285097--isotype, Fs--isotype, Me--isotype, Me--isotype, N--type).

VERBENA GLABRATA H.B.K., Nov. Gen. & Sp. Pl. 2: 276--277. 1818 [not *V. glabrata* R. A. Phil., 1870].

Synonymy: *Verbena glabrata* Humb. ex Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825. *Verbena glabrata* Kunth ex Schau. in A. DC., Prodr. 11: 542, in syn. 1847. *Verbena glomerata* Hérincq & Gerard in Réveil, Règne Vég. 4: pl. 18. 1870. *Verbena glomerata* Auct. ex Stapf, Ind. Lond. 6: 429. 1931.

Bibliography: H.B.K., Nov. Gen. & Sp. Pl. 2: 276--277. 1818; Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825; Walp., Repert. Syst. Bot. 4: 20. 1845; Schau. in A. DC., Prodr. 11: 542. 1847; Hérincq & Gerard in Réveil, Règne Vég. 4: pl. 18. 1870; Hook. f. & Jacks., Ind. Kew. 2: 1178. 1895; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 35, & 101. 1942; Moldenke, Holmbergia 4: 151. 1945; Moldenke, Bot. Gaz. 106: 162. 1945; Moldenke, Alph. List Cit. 1: 10, 28, 128, & 268 (1946), 2: 531 & 641 (1948), 3: 687, 728, 737, 805, 813, 857, 871, 872, 901, & 972 (1949), and 4: 1075 & 1078. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 70, 71, 73, & 193. 1949; R. Espinosa, Est. Bot. Sur Ecuad. 2: 68. 1949; Moldenke, Phytologia 3: 286 & 375. 1950; Moldenke, Sp. Subsp. Cont. Mold. Set 45 [3]. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951;

Moldenke, Phytologia 4: 267. 1953; Moldenke, Inform. Mold. Set 48 Spec. [4] (1954) and 49 Spec. 3. 1954; Moldenke, Mem. N. Y. Bot. Gard. 9: 177. 1955; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 69, 80, 81, 85, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 13 & 38 (1962), 4: 16 (1962), and 6: 5 & 6. 1963.

Illustrations: Hérincq & Gerard in Réveil, Règne Vég. 4: pl. 18 (in color). 1870.

Decumbent or prostrate perennial herb, 0.5--1 m. tall, much branched, practically glabrous, usually of straggling prostrate habit, with many stems from a thick root; stems mostly procumbent, branched; branches tetragonal, usually with ascending or erect tips, to 60 cm. or even 1 m. tall; leaves decussate-opposite, mostly brunnescent or nigrescent in drying, lanceolate-oblong, 5-6.5 cm. long, 1.8--2 cm. wide, cuneate at the base, sharply incised-serrate, reticulate-venose, glabrous on both surfaces or with a few, fine, white, appressed hairs beneath and a few coarse hairs above; spikes terminal, ternate, cylindric-filiform, the lateral ones long-pedunculate and about 4 cm. long, the central ones sessile and almost 8 cm. long; bractlets lanceolate, slightly shorter than the calyx, hispidulous; calyx green, with red stripes, hispidulous; corolla varying from blue, pale-blue, or pale bluish-violet to purplish, purple, pale-violet, pale-lilac, lilac, pale-rose, or very pale-mauve, sometimes white or almost white, the tube often red, slightly surpassing the calyx, the limb often blue-violet, 5-parted; fruit red-brown, glabrous, 4-parted, included by the mature calyx.

This species was based on two collections made by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland near Almaguer, Cauca, and near Pasto, Nariño, in the Andes Mountains of Colombia. Walpers (1845) places the species in his Section *Verbenaca*, Subsection *Inermes*, Group *Foliosae*, Subgroup *Micranthae*, and Secondary Subgroup *Holophyllae*, along with 22 other species. Hooker & Jackson (1895), however, reduce it to synonymy under *V. litoralis* H.B.K., while Schauer (1847) reduces it to *V. littoralis* α *pycnostachya* Schau., with the comment "Hujus modif. monticola, magis compacta et glabrior est *V. glabrata* Kth." and cites *Herb. Willdenow 11133*. Truly, the species is closely related to *V. litoralis*, but I have personally collected both in the field and find that the habit and aspect are quite distinct.

Herbarium material has been misidentified and distributed under the names *V. gracilescens* (Cham.) Herter, *V. litoralis* H.B.K., *V. littoralis* H.B.K., *V. littoralis* L., and *V. polystachya* H.B.K.

Collectors have found *V. glabrata* growing as a weed in gardens and upon walls, in the crevices of mud-walls, along roadsides, in humid forests, in hedgerows and roadside thickets, at the edge of cultivated and waste ground, in sandy soil on the open side of quebradas, on paramos and the floor of craters, and in raod-cuts, at altitudes of 200 to 3835 meters, flowering from November to May and July to September, and fruiting in February, April, May, and July to September. Firmin reports it to be medicinal; Killip & Smith say that it is used in the treatment of fevers in Colombia. A vernacular name is "verbena".

It should be noted that the *V. glabrata* of Philippi belongs in the synonymy of *V. chilensis* Moldenke, which see.

The illustration cited above, unfortunately, is only of a single pistil and therefore is of little help in identifying accurately the plant called *V. glomerata*. Ball makes the curious statement that the flowers of *V. glabrata* open "at the tips of lengthening stem". Actually, as throughout this group, it is the rachis which lengthens and the flowers always open from the bottom upwards. In all, 97 herbarium specimens have been examined by me.

Citations: COLOMBIA: Cauca: *E. L. Core 207* (W--2059688); *H. Pittier 1428* (W--531624). Nariño: *R. Espinosa 2745* (N); *Schultes & Mardoqueo 7422* (W--1996144), *7442* (W--1996163); *Sneidern A.311* (S, S). Norte de Santander: *Killip & Smith 21197* (W--1356107). Putumayo: *Schultes & Cabrera 18901* (Ss, W--2172312). ECUADOR: Azuay: *Rose, Pachano, & Rose 22851* (N, W--1022448), *22939* (N, W--1022514). Bolívar: *Penland & Summers 602* (N). Cañar: *Rose & Rose 22730* (N, W--1022359), *22740* (W--1022367). Chimborazo: *André K.721* (N); *Mille 39* (N, W--1121423); *Rimbach 671* (N). Cotopaxi: *Weydahl 74* (S). Imbabura: *Asplund 20189* (S). Pichincha: *Anthony & Tate 333* (W--1192410); *Asplund 6110* (S, W--2223752), *16130* (S), *16139* (S), *17227* (S), *20151* (S); *Balls 5801* (N, W--1779226); *W. H. Camp E. 1746* (N); *Couthouy s.n.* [Quitensian Andes] (T); *R. Espinosa 2435* (N); *Firmin 77* (N, W--1340469); *F. R. Fosberg 22543* (N, W--2109606); *F. C. Lehmann 131a* (Bm); *Moldenke & Moldenke 19783* (B, Bs, Cb, F, Fy, Hk, Hw, Le, Lm, Mg, Mm, Mr, N, N, N, No, Ok, Ot, Ps, S, Sm, Ss, Ss), *19784* (B, Bs, F, Fy, Hk, Hw, Le, Lm, Mg, Mr, N, N, N, No, Ok, Ot, Rs, S, Sm, Ss, Ss, Z); *G. W. Prescott 133* (N). Tunguragua: *Asplund 19923* (S); *Heinrichs 65* (N); *G. H. H. Tate 562* (W--1197554). Province undetermined: *Mille 16203* (Kr). GALAPAGOS ISLANDS: Albemarle: *A. Stewart 3317* (Bi, Gg--31375, N, W--921597). Chatham: *Schimpff 132* (N). PERU: Arequipa: *Alva A. 0189* (W--2270251). Ayacucho: *R. D. Metcalf 30294* (W--1834981). Cuzco: *Herrera 3362* (N). Lima: *R. Ferreyra 4087a* (N). San Martín: *Ll. Williams 5911* (W--1496643).

VERBENA GLANDULIFERA Moldenke, Phytologia 3: 44. 1948.

Synonymy: *Glandularia glandulifera* (Moldenke) Ragonese, Revist. Invest. Agric. 5: 33 & 206. 1951. *Glandularia glandularia* Ragonese, Revist. Invest. Agric. 6: 82, sphalm. 1951.

Bibliography: Moldenke, Phytologia 3: 44 (1948) and 3: 76 & 135. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Phytologia 3: 305. 1950; Ragonese, Revist. Invest. Agric. 5: 40, 85, 207, & 208 (1951) and 6: 82, 83, & 206. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 127, 296, & 471. 1959.

Procumbent or prostrate annual herb, or to 50 cm. tall; stems and branches rather slender, obtusely tetragonal, spreading-pubescent or hirtellous with hair of various lengths, the shorter hairs glanduliferous; nodes annulate; principal internodes 1--1.5 cm. long or more abbreviated; leaves numerous, decussate-opposite; petioles 3--8 mm. long, margined; leaf-blades chartaceous, rather uniformly gray-green on both surfaces, ovate, 1--1.5 cm. long, 7-12 mm. wide, 3-lobed or 3-parted, each lobe again lobed or bluntly incised, revolute-margined, acuminate-attenuate at the apex, acuminate-attenuate into the petiole at the base, strigose above, irregularly spreading-pubescent beneath, the shorter hairs glanduliferous; midrib very slender, deeply impressed above, very prominent beneath; secondaries and tertiaries very slender, deeply impressed above, very prominent beneath; inflorescence terminal, subcapitate at first, later elongating to about 4 cm.; peduncles 1--2.5 cm. long, spreading-pubescent or hirtellous with hair of various lengths, the shorter hairs gland-tipped; bractlets lanceolate, about 5 mm. long, attenuate at the apex, puberulent on the back, long-ciliate along the margins; calyx tubular, about 6 mm. long, irregularly pubescent with gland-tipped hairs, 5-costate, the rim 5-apiculate; corolla small, varying from blue to lilac or violet, its tube 8--9 mm. long, very minutely puberulous on the outside or subglabrate, its limb about 5 mm. wide.

The type of this species was collected by Nélida S. Troncoso (*no. 292*) at Ascochinga, at an altitude of 700 meters, Córdoba, Argentina, on October 26, 1936, and is deposited in the Britton Herbarium at the New York Botanical Garden.

The species has been found on high rocky plateaus and on a hill near a limestone quarry, at altitudes of 700 to 2100 meters, flowering from October to April, fruiting in March and April. Burkart describes it as "common" and Troncoso as "very abundant" in Córdoba. It has been misidentified and distributed in herbaria under the names *V. erinoides* Lam., *V. marrubioides* Cham., *V. microphylla* H.B.K., and "cf. *V. marrubioides* Cham." Ragonese describes the flowers as "muy vistosas" and says "Especie originaria de las Provincias de Córdoba y Catamarca, que únicamente hemos observado en una sola oportunidad en el terraplén de las vías del ferrocarril." He distinguishes it from the related *V. dissecta* Willd. as follows:

1. Calyx with glandular hairs; corolla 10--14 mm. long.......... *V. glandulifera*.
1a. Calyx pubescent, but without glandular hairs; corolla 7--10 mm. long.................................*V. dissecta*.

In all, 32 herbarium specimens, including the types of all the names involved, and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Catamarca: *Brizuela 469* (N); *Cabrera*

1099 (Ja--30392, N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33877] (N); Jörgensen 1026 (W--704752); Ragonese & Piccinini 6032 [Herb. Inst. Bot. Minist. Agr. Nac. 69123] (N). Córdoba: H. H. Bartlett 20079 (Mi), 20174 (Mi); Burkart 7494 [Herb. Osten 23367] (Ug), 10413 (N); Castellanos s.n. [Herb. Osten 15289] (Ug), s.n. [Herb. Osten 15291] (Ug); T. H. Goodspeed 17246 (Ca--656782); Hieronymus s.n. [4.XI.1876] (W--281545); A. T. Hunziker 7175 (N); Lossen 72 (Ba, Mg--31); O'Donell 4427 (N), 4467 (N); O'Donell & Rodriguez 340 (Ut--115416b), 493 (Ut--115407b), 610 (Ut--115417b); Osten 10613 (Ug), 17091 (Ug); Pierotti 5108 (N); F. A. Roig 1044 [Herb. Ruiz Leal 17833] (Z); Sota 4309 (N); Troncoso 292 (F--photo of type, N--type, N--photo of type, Si--photo of type, Z--photo of type). San Luis: Digilio & Grassi 2028 (N); Terribile 739 (N). Santiago del Estero: Pierotti "h" [Tazana, 3/IV/44; Herb. Inst. Miguel Lillo 99460] (Bm, S), s.n. [Villa Gussayán, April 9, 1944; Herb. Inst. Miguel Lillo 99587] (S).

VERBENA GLUTINOSA Kuntze, Rev. Gen. Pl. 3 (2): 256. 1898.

Synonymy: Glandularia glutinosa Schnack & Covas, Darwiniana 7: 72, 74, & 75, pl. 2E, nom. nud. 1945. Verbena fischeri Moldenke, Alph. List Cit. 2: 625, hyponym. 1948.

Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 256. 1898; Briq., Ann. Conserv. & Jard. Bot. Genèv. 4: 21. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 191. 1904; Sanzin, Anal. Soc. Cient. Argent. 88: 97, 98, 124--126, & 134. 1919; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Lilloa 6: 328 (1941) and 8: 430. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Moldenke, Lilloa 10: 384. 1944; Schnack & Covas, Darwiniana 7: 72, 74, & 75, pl. 2E. 1945; Schnack & Covas, Revist. Argent. Agron. 12: 223. 1945; Schnack & Covas, Darwiniana 7: 75. 1945; Covas & Schnack, Darwiniana 7: 86. 1945; Moldenke, Alph. List Cit. 1: 96 (1946), 2: 443 & 629 (1948), 3: 687 (1949), and 4: 1255. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 98, 106, & 198. 1949; Moldenke, Phytologia 3: 134 & 135 (1949) and 3: 290. 1950; Moldenke, Résumé 115, 127, & 471. 1959; Moldenke, Résumé Suppl. 3: 32 & 37. 1962.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. 88: 125. 1919; Schnack & Covas, Darwiniana 7: pl. 2E. 1945.

Perennial very glabrous or glutinous herb, to 35 cm. tall, often retaining blown grains of sand; stems many, terete, to 50 cm. long, few-branched, glabrous or scarcely pilose, glutinous or subglutinous throughout; branches often decumbent, forming mats; principal internodes to 2 cm. long; leaves decussate-opposite, sessile, scarcely decurrent, linear-elongate or linear-lanceolate, to 3 cm. long and 2 mm. wide, entire or sometimes with 1 or 2 scattered very narrow teeth or lobes, the lobes 0.5-1 cm. long and basal or sub-basal, the margins scarcely involute; inflorescence spicate, the spikes at first densely, finally loosely few-flowered, terminal; peduncles 1--3 cm. long; bractlets small, herbaceous, about 2 mm. long, ovate, acute at the apex, ciliate along the margins; flowers about 5 per spike, slightly fragrant; calyx long-tubular, about 10 mm. long and 1 mm. wide, its rim with 2 or 3 linear-subulate teeth, shorter than the tube; corolla showy, varying from creamy-white or yellowish-green to yellow, pale-yellow, or sulphur-yellow to rose, the tube almost straight, to 15 mm. long, about 1 mm. wide at the apex, the limb to 6 mm. wide, the lobes narrow, deeply emarginate at the apex.

The type of this species was collected by Carl Ernst Otto Kuntze [*no.* (?) "*2*"] in the Cordillera at Paso Cruz, 34° S. lat., Mendoza, Argentina, at an altitude of 1500 meters, in January, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. This specimen is also the type of *V. fischeri*.

Ruiz Leal describes the species as being very common all through the Mendoza region in Cretaceous sand and basaltic detritus and abundant in sandy places on undulating pampas. Wilczek describes it as "frequent". It has been collected in green meadows and sandy deposits, in arroyos, and on campos, at altitudes of 200 to 1950 meters, flowering from October to February, in fruit in January. Ruiz Leal reports that it forms mats on undulating pampas in Mendoza, preferring sandy places. Herbarium material has been misidentified and distributed under the names *V. sulphurea* D. Don and *Glandularia laciniata* Schnack. The relation of the length of style to the size of the pollen-grains is discussed by Covas & Schnack (1945). Schnack & Covas (1945) discuss the possibility of a hybrid between *V. glutinosa* and *V. peruviana* (L.) Britton.

Briquet (1900) says: "Cette belle espèce est remarquable par ses feuilles linéaires allongées, pourvues ça et là d'un ou deux segments très étroits, sa glabréité, ses glandes visqueuses retenant les grains de sable de la pampa, ses longs calices tubuleux à dents linéaires-subulées et ses élègantes corolles d'un jaune soufré à lobes profondément échancrés au sommet....Il est singulier qu'un type aussi saillant, comme les précédents d'ailleurs ait pu échapper jusqu'à maintenant aux recherches des botanistes argentins." He cites *Wilczek 54* from Pampa de San Rafael in the Delessert Herbarium. Peredo describes the corolla of his plant as "purple", surely an error, although it is possible that the yellow corollas may fade out to a rose hue; in fact, *Ruiz Leal 9655* bears a notation to the effect that the corolla is "yellow verging to red" or "cream to rose". Kuntze says: "Gehört in die Verwandschaft von *V. sulfurea*, ist aber durch die linearen Blätter, von denen unter 100 etwa 2--3 nur einen Blattzehn zeigen, die unbehaarte glutinose Beschaffenheit etc. recht verschieden....*V. lavandulifolia* Phil. hat ähnliche Blätter, aber kopfige, behaarte Inflorescenz, kurz Corolle, lange Bracteen. *V. decurrens* hat viereckigen Stengel, herablaufende Blätter mit umgebogenen Rand und sonstige Unterschiede."

In all, 31 herbarium specimens, including the types of all the names involved, and 1 mounted photograph have been examined by me.

Citations: BOLIVIA: Santa Cruz: Peredo s.n. [El Concho, 4-I-1947] (N). ARGENTINA: Mendoza: H. H. Bartlett 19521 (Au--195097, Ca--772483, Mi, Mi, W--1904542, W--1904543); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 36864] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 36865] (N); Kuntze 2 [Macbride photos 17418] (Kr--photo of isotype, N--type); F. A. Roig s.n. [Ruiz Leal 11935] (Z); Ruiz Leal 1952 (N), 6936 (N), 7093a (N), 7463 (N), 7500 (N), 7665 (N), 7665/14 [Goodspeed 31014] (Ca--178039, W--2322928), 7671 (N), 7671/20 [Goodspeed 31020] (Bm), 7694 (N), 9455 (N), 9655 (N), 10384 (N); Sanzin s.n. [Ruiz Leal 1414] (N); Wilczek 54 (W--1473108), 514 (W--1473109). Neuquen: F. A. Roig s.n. [Ruiz Leal 18050] (Sm). Río Negro: Calcagnini 39 [Herb. Osten 19358; Herb. Lab. Bot. Buenos Aires 13531] (Ug).

xVERBENA GONZALEZI Moldenke, Phytologia 8: 274. 1962.

Synonymy: Glandularia santiaguensis x pecakii Schnack & Gonzalez, Rev. Argent. Agron. 12: 290, in textu. 1945.

Bibliography:Schnack & Gonzalez, Rev. Argent. Agron. 12: 290. 1945; Moldenke, Phytologia 8: 274. 1962; Moldenke, Résumé Suppl. 4: 10, 11, & 18. 1962.

This name has been proposed for the hybrid between V. santiaguensis (Covas & Schnack) Moldenke and V. perakii (Covas & Schnack) Moldenke, thus far known only from artificial production. The hybrid may, however, be expected in the wild, since the two parental species both grow in the provinces of La Rioja and Mendoza, Argentina.

VERBENA GOODDINGII Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 103--104. 1907.

Synonymy: Verbena verna var. fissa A. Nels., Am. Journ. Bot. 18: 437. 1931. Verbena goodingii Briq. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena bipinnatifida var. gooddingii (Briq.) Jepson, Fl. Calif. 3 (2): 382--383. 1943. Verbena gooddringii Briq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Glandularia gooddingii (Briq.) Solbrig, Madroña 15: 50. 1959. Verbena gooddingii x wrightii Kearney ex Moldenke, Résumé 364, in syn. 1959. Verbena bipinnatifida var. gooddingii Jepson ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena gooddingii Brand. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodingii (Briq.) Munz ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena gooddingii var. gooddingii Briq. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodengii Briq. ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 103--104. 1907; Prain, Ind. Kew. Suppl. 4: 245. 1913; A. Nels., Am. Journ. Bot. 18: 437. 1931; Perry, Ann. Mo. Bot. Gard. 20:

243, 248, 312, 335--337, & 355. 1933; Laudermilk & Munz, Carnegie Inst. Wash. Publ. 487: 279. 1938; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Prelim. Alph. List Invalid Names 49. 1940; Moldenke, Suppl. List Invalid Names 8. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 19 & 45. 1942; Moldenke, Alph. List Invalid Names 47 & 51. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 11, 13--15, 18, & 101. 1942; Jepson, Fl. Calif. 3 (2): 382--383. 1943; Moldenke, Alph. List Cit. 1: 6, 23, 25, 31, 34, 57, 110, 119, 154, 200, 208, 209, 235, 242--244, 255, & 269. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 24. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 43 & 61. 1948; Moldenke, Castanea 13: 121. 1948; Moldenke, Alph. List Cit. 2: 438, 439, 452, 465, 467, 472, 474--478, 480, 482--484, 493--495, 497, 498, 503--505, 521--528, 579, 584, 587, 596, 597, 604, & 629 (1948), 3: 666, 671, 701, 702, 707, 717, 721, 723, 741, 755, 756, 769, 770, 779, 788, 794, 803, 804, 826, 828, 834, 842, 851, 871, 883, 933, & 952 (1949), and 4: 989, 996--998, 1002--1004, 1083, 1104, 1125, 1127, 1136, 1138, 1139, 1155, 1169, 1174, 1178, 1180, 1198, 1199, 1207, 1210, 1214, 1217, 1222, 1225, 1227--1231, 1237, 1239, 1240, 1242-1246, 1252, 1253, 1288, 1290, 1292, & 1298. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 11, 19, 20, 23, 25--27, 33, 164, & 198. 1949; Moldenke, Am. Wild Fls. 292 & 450. 1949; Moldenke, Phytologia 3: 132 & 133. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Clokey, Univ. Calif. Publ. Bot. 24: 198--199 & 274. 1951; Moldenke, Phytologia 4: 119. 1952; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; Moldenke, Journ. Calif. Hort. Soc. 15: 82. 1954; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Résumé 14, 24, 26, 29, 31, 33, 39, 223, 358, 364, 378, 379, & 471. 1959; Solbrig, Madroña 15: 50. 1959; Moldenke, Résumé Syppl. 2: 10 (1960), 3: 6, 8, 10, 32, & 38 (1962), 5: 3 (1962), and 6: 10. 1963.

Perennial (sometimes annual?) herb, decidedly gray-green throughout, forming rounded clumps or mats 15--60 cm. in diameter, often prostrate; stems usually several from a common woody base or thick rootstock, decumbent-ascending or erect, 15--60 cm. tall, stout, subobtusely tetragonal, usually much branched, densely spreading-pilose or somewhat white-villous, often glandular; branches ascending; principal internodes 3--6 cm. long; leaves decussate-opposite, 3--5 cm. long, about 3 cm. wide, gray-green on both surfaces, deeply 3-lobed or 3-cleft and softly canescent-pilose to more or less villous-hirsute on both surfaces, tapering at the base into a short margined petiole, the divisions broadly oblong, about 3 cm. long, coarsely toothed or incised to deeply incised-crenate, the margins slightly (if at all) revolute; midrib and secondary venation prominent or prominulous beneath; inflorescence terminal, pedunculate, fascicle-like during anthesis; peduncles 4--8 cm. long, stout, softly cinereous-pilose or villous-hirsute with white hairs; bractlets lanceolate, about 7 mm. long, a little shorter than the calyx, acuminate at the apex, coarsely spreading-pilose or villous-hirsute throughout, long-ciliate on the margins; flowers corymbose during anthesis, the corymbs to 2.5 cm. wide, the spikes somewhat or greatly elongating after anthesis and then about 5 cm. long and 1.8 cm. wide; calyx oblong-cylindric, 8.5--11 mm. long, spreading-pilose or villous-hirsute with white hairs throughout, more or less glandular, its tube about 7 mm. long and rather prominently costate, the teeth unequal or subequal, slender, lanceolate-subulate, about 2 mm. long; corolla hypocrateriform, showy, varying from red, pink, blue-red, lavender, light-lavender, pale-lavender, bluish-lavender, or lavender-blue to rich blue-lavender, purple, blue-violet, light blue-violet, violet, light-blue, or blue, sometimes whitish or white, usually pink, pale-lavender, or lavender when fresh and fading to blue, the tube not at all or slightly surpassing the calyx, pubescent on the outside, puberulent in the throat, the limb spreading, 8--12 mm. wide, subequally 5-lobed, the lobes obovate-subtruncate, about 3 mm. long and wide, retuse or slightly emarginate at the apex; stamens barely equaling the corolla-mouth; anther-glands small; pistil barely equaling the corolla-mouth; fruiting-calyx about 10 mm. long; cocci oblong-elongate, brown or black, 3--4 mm. long, subcylindric, reticulate-scrobiculate or alveolate on both sides except at the merely striate base, retrorsely hispidulous on the commissure in a white linear-oblong conspicuous band.

The type of this handsome species was collected by Leslie Newton Goodding (*no. 645*) -- in whose honor it is named -- at Kernan, in the Meadow Valley Wash, Nevada, in 1902, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Meadow Valley Wash extends into both Lincoln and Clark Counties, but the type locality is assumed to be in Clark County. The species is widespread in Arizona, and extends also into adjacent New Mexico, Texas, California, Utah, Nevada, and Oklahoma, as well as Mexico. It was introduced into cultivation in 1929. Briquet (1907) says of it: "Cette espèce est rapportée dans l'exsiccata cité au *V. bipinnatifida* Nutt. qui en diffère abondamment par ses feuilles bipinnatipartites à segments étroits, l'indument rare, les bractées beaucoup plus longuement setacées, les dents calicinales longuement subulées, le tube de la corolle exsert, etc. Elle est en réalité plus voisine du *V. arizonica*, dont elle s'écarte au premier abord par ses feuilles profondement tripartites." Heller reports that the fresh flowers are usually whitish, pink-tinged, turning darker or bluish in drying. Kearney notes for *Fulton 6266*, cited below, that "gland small on one stamen, rather large on the other, but not as high as the anther-cells."

The type of *V. verna* var. *fissa*, which is said to differ from *V. verna* in having pinnately cleft leaves, is *Munz, Johnston, & Harwood 4252*, eposited in the Rocky Mountain Herbarium.

The so-called hybrid, *V. gooddingii* x *wrightii* Kearney, was based on *Ethel Palmer s.n.* from San Carlos, Gila County, Arizona, concerning which Kearney says "Corolla tube too long for *V. gooddingii*." He also says of *Eastwood 16979* "leaves exceptionally dissected but corolla tube not longer than calyx; possibly a hybrid with *V. wrightii*" and of *Eastwood 17772* "corolla tube 1 1/2 times calyx!; possibly a hybrid with *V. wrightii*". Of *Clover 6383* he says "leaves more dissected and pubescence stiffer than usually". Concerning *Nodwell 7086* he notes "gland rather small, much lower than the anther-cells". *Loomis 835* was first determined as "*V. ambrosiaefolia* Rydb.", then as *V. wrightii* A. Gray, but Peebles and Kearney comment about it "calyx minutely glandular, pubescent with the usual tack-shaped hairs; gland very large, considerably surpassing the anther cells." *Kearney & Peebles 10993a* and *Peebles 11332* were first identified as *V. ciliata* Benth., then as *V. wrightii*; so was *Peebles 9186*, whose bractlets are actually long and narrow and which may possibly represent a hybrid with *V. bipinnatifida*.

Verbena gooddingii has been found by collectors on hills, hillsides, and rocky hillsides, foothills and mountain slopes, flats, open or brushy flats, and dry canyon floors, in grasslands and pinyon forests, riverbeds, in clay or sandy soil, granitic soil, along roadsides, among rocks, on dry rocky slopes and gravelly hillsides, on roadside embankments and grassy slopes, in dry sandy washes, dry or sandy bottoms, and creek bottoms, on the sides of ravines, in deserts and desert grasslands, on burned-over gravelly slopes and rocky limestone slopes, sandy areas, mountainsides, desert washes, sandy flats, on canyon floors and stony adobe slopes, in the *Artemisia tridentata* and *Juniperus* association on rocky slopes, in the *Pinus monophylla* and *Juniperus* association, in juniper and ponderosa pine forests, in the juniper and yellow pine belts of vegetation, on hillsides under oaks, in sandy arroyos, and among the browse-type vegetation, at altitudes of 665 to 5670 meters. It has been collected in anthesis from February to November, and in fruit from March to October.

In Texas it is found in sandy soil and washes and on mountains. Heller states that the species is "occasional in gravelly places in juniper and oak belt of the Upper Sonoran Life Zone", Ferris found it "associated with two species of scrub oak, *Cercocarpus*, and *Rhus trilobata*", while the Hansons report it as "frequent in washes". Benson says that it occurs in the "limestone soil of Chihuahuan desert vegetation type", in the "Sonoran desert vegetation type", "in sand and gravel in the Lower Sonoran zone", and in the "Oak Woodland vegetation type"; Benson & Darrow report it from the "Southern Desert vegetation type", while Wolf, Johnson, & Everett found it at the "lower edge of Upper Sonoran life-zone with *Yucca baccata* in open sun in gravelly wash". Grater found it in the pinyon belt on a plateau at the head of a canyon; Clover found it on Kaibab limestone and in canyons; Darrow says that it is "frequent in gravelly canyon bottoms"; Brass reports it "frequent in damp soil of floodplains"; and Tidestrom says that it is "occasional on slopes".

In Arizona it was found by Demaree in "small fair habitats on dry red ridges". Cutler found it "frequent in pastures" in New Mexico. Wold discovered it in the Lower Sonoran zone "with Joshua trees, *Salvia carnea pilosa*, in sun, in dry sandy gravel in wash", "in the Upper Sonoran life-zone with pinyons and junipers, common in sun of rocky wash", "scattered in Upper Sonoran life-zone with *Pinus monophylla*, *Yucca baccata*, and *Juniperus utahensis* with western exposure to sun in dry gravel of open flats", "with *Yucca baccata* and *Juniperus*", and "in the Upper Sonoran life-zone on sunny hillside in deciduous red-brown volcanic rock." Ferris found it forming groundcover with *Helenium hoopesii*, *Delphinium*, *Artemisia*, and *Pteris* in pine forests. *J. Goodwin 63* appears to have had white flowers and may represent a white-flowered form worthy of nomenclatural designation. *Edw. Palmer 339* is also said to have had white flowers.

Common names for the species are "southwestern verbena", "southwestern vervain", and "vervain". Material has been misidentified and distributed in herbaria under the names *V. ambrosiaefolia* Rydb., *V. ambrosiifolia* Rydb., *V. aubletia* Jacq., *V. aubletia* Willd., *V. aubletiana* Willd., *V. bipinnatifida* Nutt., *V. bipinnatifida* var. *latilobata* Perry, *V. canadensis* (L.) Britton, *V. ciliata* Benth., *V. ciliata* var. *longidentata* Perry, *V. ciliata* var. *pubera* (Greene) Perry, *V. gooddingii* var. *nepetifolia* Tidestr., *V. longiflora* Lam., *V. remota* Benth., *V. stricta* Benth., *V. wrightii* A. Gray, and *Verbenia wrightii* Gray.

On the other hand, *H. S. Gentry 1312*, distributed as *V. gooddingii*, is actually *V. delticola* Small; *Herb. Chiricahua Veg.-Study Team 1958-118* is *V. ambrosifolia* f. *eglandulosa* Perry; *Mc Clatchie 175* & *176* are *V. ciliata* var. *longidentata* Perry;*Goodding 26-47*, *G. W. Gullion 477*, *M. E. Jones s.n.* [Clark Mts., Sept. 14, 1932], *W. W. Jones s.n.* [near Bisbee, Sept. 13, 192?], *Loomis & Thackery 910*, and *Wiggins 9146* are var. *nepetifolia* Tidestr., and *Solbrig 2803*, distributed as *Glandularia gooddingii*, is *V. bipinnatifida* Nutt.

As further evidence of how this species has been misunderstood by herbarium workers in the past -- *Eastwood 17119* was first identified as "*V. ambrosiaefolia* Rydb.", then as *V. wrightii* by Kearney; *H. H. Rusby 337* was determined by the collector as *V. bipinnatifida* and by Farwell as *V. wrightii*; *Kearney & Peebles 10993* & *11118* were first determined as *V. ciliata*, then as *V. wrightii*; while *S. W. Hutchinson s.n.* [May 1929] was annotated by various workers as *V. canadensis*, *V. remota*, *V. aubletia*, *V. longiflora*, *V. bipinnatifida*, and *Glandularia* sp. *Edw. Palmer s.n.* [southern Arizona, 1869] was first identified as *V. aubletia*, then as *V. ciliata*, while Kearney says of it "seems rather nearer *wrightii*". Of *H. H. Rusby 337* Kearney says "I make this *wrightii*", of T. E. Wilcox 26 and Zuck s.n. [Tucson, May 16, 1896] he says definitely "V. wrightii", while of Eastwood 18032 and T. E. Wilcox s.n. [near Williams, April 11, 1905] he says "V. wrightii?". Of Tidestrom 772 Miss Perry says "not typical", while Kearney says "V. wrightii?"; of Griffiths 4435 Kearney says "V. wrightii?", while Perry says "cfr. V. gooddingii". Of Lemmon & Lemmon s.n. [Peach Springs, June 1884] she says "toward var. nepetifolia". Of Kearney & Peebles 9720 Kearney says "Intermediate between Wrightii and Gooddingii".

On the label of C. T. Mohr s.n. [Gila River, Feb. Mar. 1873] the collector says: "This species has been recently introduced into gardens under the name of V. montana. It is very variable in foliage and habit." He is here referring, however, not to the plant comprising his specimen, but to the name which he assigned to it, V. aubletia. Both the name V. aubletia and V. montana Hort. are synonyms of V. canadensis (L.) Britton, a species which is, indeed, "very variable in foliage and habit." Kearney & Peebles 11118 is identified by Kearney as V. wrightii.

Ferris & Bacigalupi 8135 is a mixture with Tragia ramosa Torr., while Nelson & Nelson 1429 in the herbarium of Catholic University was mounted with Fox J.7, which is V. ciliata. The Collector undesignated s.n. [Partridge Creek, April 26] is a mixture with V. ciliata var. pubera (Greene) Perry.

It should be pointed out that the Newlon 653 from the Santa Rita Mountains, cited below, could be from either Pima or Santa Cruz Counties, Arizona; Dudley 10, from the Hualapi Indian Reservation, cited below from Coconino County, could as well be from Mohave County; and Eastwood 17119, from the Mazatzal Mountains, cited below from Maricopa County, could be from Gila or Yavapai County. Miranda & Deaver 5785 has a label reading "Mohave or Yavapai County". The Plumer 1345 collection, cited below, was cited by Perry as V. bipinnatifida.

Mattoon (1958) notes that the seeds of V. gooddingii are offered to the horticultural trade by Clyde Robin.

Perry (1933) cites the following 20 additional specimens not as yet seen by me: NEVADA: Clark Co.: Goodding 645 (E--isotype, F--isotype, G--isotype). ARIZONA: Cochise Co.: Carlson s.n. [Sulphur Springs Valley, June 3, 1915] (W); W. F. Parish 196 (G), 197 (G). Gila Co.: Goodman & Hitchcock 1297 (E). Maricopa Co.: Bartram 255 (D). Mohave Co.: M. E. Jones s.n. [Hackberry, 5-24-1884] (F). Pima Co.: Hanson & Hanson A.1021 (E, F). Yavapai Co.: Coues & Palmer 498 (E); W. W. Jones s.n. [Jerome Divide, 25 July 1921] (E). CALIFORNIA: San Bernardino Co.: Edw. Palmer 339 (E, F), s.n. [Rock Spring, May 1876] (G). San Diego Co.: Edw. Palmer s.n. [southern part of San Diego Co., 1875] (G). MEXICO: Baja

California: Orcutt s.n. [7-25-1883] (F). She says "In habit V. Gooddingii is much like V. ciliata, but differs in the villous-hirsute pubescence and the larger flowers. It is readily recognized in its typical form by the long-ciliate character of the bracts, the short dense villous spikes, and the shaggy pubescence." The Mearns collection from Fort Verde, 1881, and the Mac Dougall 603, which she cites from the Britton Herbarium, are regarded as var. nepetifolia by me, and the Edw. Palmer 339 which she cites from the same herbarium, is also regarded by me as var. nepetifolia, although specimens under this collection number in other herbaria may not represent the same taxon. Palmer's numbers, assigned largely by Asa Gray, are notoriously full of mixtures.

In all, 446 herbarium specimens, including type material of most of the names involved, have been examined by me.

Citations: ALABAMA: Bibb Co.: C. T. Mohr s.n. (Mi). UTAH: Washington Co.: M. S. Baker 8437 (N); Eastwood & Howell 1242 (Gg-206895, N); F. W. Gould 1386 (Ca--882644, N), 1730 (Ca--882643, Gg, N, Pl--156720); Maguire & Richards 15921 (Ua--21325); B. Mc Allister s.n. [May 15, 1938] (Ua--47417). County undetermined: J. E. Johnson s.n. [s. Utah, 1876] (W--56196); Purpus s.n. [Cave Spring, May--Oct. 1898] (Ca--104881). NEVADA: Clark Co.: Clokey 7282 (Ca--900551), 7283 (Bl--42304, Ca--900553, Ca--909945), Du--269985, N, Se--47446, St--19114, Ua--31276), 7284 (Ba, Ca--909943, Du--269954, N, Pl--124972, Se--47605, St--19129, Ua--31283), 7686 (Ba, Ca--598472, Ca--900554, Du--258943, Gg--257095, Hp, I, La, N, Ok, Rs--20239, Se--47852, Se--52083, Ua--25349, W--1729913); Goodding 645 (Ca--50874--isotype, Du--91127--isotype, N--isotype, Po--63875--isotype, W--485355--isotype); G. W. Gullion 26f (Ca--195471); Jaeger s.n. [William Ranch] (Po--159913); Purpus 6061 (Ca--104816, Po--63967, W--348177); Train 1458 (Ca--900555, Du--287457, I, N, Tu--35539), 2009 (N). Lincoln Co.: M. E. Jones s.n. [Calientes, April 29, 1904] (Po--71255). Nye Co.: La Rivers & Hancock 401 (Ca--900552). COLORADO: County undetermined: C. C. Parry 551, in part (W--1323045). OKLAHOMA: County undetermined: G. W. Stevens 346 (Ok). TEXAS: Brewster Co.: J. F. Brenckle 51083 (Le); Nelson & Nelson 5025 (Ca--710304, W--1974036). Uvalde Co.: M. E. Jones 28301 (Po--188427). NEW MEXICO: Catron Co.: D. R. Goddard 825 (Ca--505486). De Baca Co.: A. Nelson 11307 (S). Grant Co.: Ballou s.n. [Mar. 4, 1928] (Du--193773); Maguire, Richards, & Moeller 11503 (N); C. T. Mohr s.n. [Gila River, Feb. Mar. 1873] (W--771874). Otero Co.: Cutler 2002 (Ca--882847). County undetermined: H. H. Rusby 337 (Mi). ARIZONA: Apache Co.: F. M. Chamberlain 56 (W--562805). Cochise Co.: L. D. Benson 10301 (Po--267648, Tu--35541), 11110 (Po--267657); Blumer 1345, in part (Du--9535, Se--92553); Borell s.n. [Bonita Canyon, Sept. 8, 1935] (Ca--771364); J. I. Carlson s.n. [May 20, 1915] (Gg--

31279), s.n. [Sulphur Springs Valley, June 3, 1915] (Gg--31280), s.n. [south of Warren, June 3, 1915] (W--873380), s.n. [south of Warren, June 7, 1915] (W--873381); O. M. Clark 8120 (St); Deaver 4579 (Gg); R. S. Ferris 9933 (Ca--882569, Du--278064); Foster & Arnold 206 (W--1826646); Goodding 38-50 (Gg--365609, St), 1972 (St), 2231 (Ca--130090); Goodman & Hitchcock 1211 (Du--192000); Gould & Pultz 3154 (Tu--21550), 3169b (Ca--705200, N, Tu--21586); W. W. Jones s.n. [Dragoon, Aug. 18, 1920] (Ca--407934); Kearney & Peebles 15117 (Gg--418631); Lemmon s.n. [Huachuca Mts., Aug. 1882] (Bm); W. F. Parish 190 (Du--90889); W. W. Price s.n. [Apr. 21, 1894] (Du--97120); H. A. Thornber 2981 (Tu--35544); Wiegand, Maguire, Richards, & Moeller 11150 (N), 11162 (N, Ua--47412); C. B. Wolf 2490 (Ba, Rs--9998). Coconino Co.: Benitez s.n. [Sedona, 5-7-50] (Fg--3460); Clover 6383 (Gg--325858, Mi, Tu--18626); Darrow 3112 (Tu--22019); Deaver 7 (Fg--735-374-111), 47 (Fg--734-374-111), 91 (Fg--797-374-111), 290 (Fg--871-460-111), 1527 (Fg), 2483 (Fg--2837), 3135 (Fg--3903), 3232 (Fg--3979); Demaree 40269 (Ca), 40973 (Gg), 40991 (Gg), 42557 (Gg), 44310 (S); Dudley 10 (Gg--191651); D. R. Goddard 525 (Ca--505526); A. A. Heller 15794 (Ca--726072, N, Se--87492); Jaeger s.n. [Flagstaff, Sept. 1/23] (Po--63851); Kleiner s.n. [Midgley Bridge, 4/12/50] (Fg--3459); Nelson & Nelson 2082 (Ca--580304, N, N, S, Ua--23757); H. H. Rusby 337 (W--771879); Toumey s.n. [Grapevine Cañon, July 30, 1891] (W--56195); Whiting 1047 [cat. 4926] (To); T. E. Wilcox s.n. [near Williams, April 11, 1905] (W--562357). Gila Co.: Collom 21 (I), s.n. [Collom Camp] (Mi, N); Crosswhite & Sands 788 (Hi--194697); Demaree 43717 (S); Eastwood 16635 (Gg--161994), 16979 (Gg--167367); Foster & Arnold 264 (W--1826662); Goodman & Hitchcock 1297 [Herb. Drushel 8501] (Ca--426359, Du--191998, Gg--183906, Mi, Mn--17980, N, Ur); J. Goodwin 63 (Fg--2253, Gg--335923); F. W. Gould 4707 (Ca--773726); MacFadden 1054 (En--3169); Nelson & Nelson 1832 (Ca--580305, I, N, S, Ua--23758); Ethel Palmer s.n. [San Carlos, April 1932] (Gg--195225); Shreve 7451 (Rs--14794). Graham Co.: Toumey s.n. [Galiuro Mts., July 29, 1894] (W--619182), s.n. [Galiuro Mts., July 29, 1895] (Ca--25131); C. R. Van Cleve 43 (Au). Greenlee Co.: Gould & Haskell 4023 (Ca--737167, N). Maricopa Co.: Benson 10018 (Po--267647, Tu--7642); Eastwood 17119 (Gg--167368); F. R. Fosberg S.1439 (Up); J. W. Gillespie 5365 (Ba, Ca--499472, Du--217487, N, Po--218527, W--1620207); Kearney & Peebles 10993 (To), 10993a (To); Lawrence & Surber s.n. [3-27-60] (Hi--194944); Peebles 6732 (N); Peebles & Loomis 6732 (Gg--192659, Tu--35526). Mohave Co.: S. B. Benson 65 (Ca--526616); Braem 793 (Fg--9267), s.n. [Apr. 10, 1927] (Du--190298), s.n. [Apr. 1927] (Du--190297); Demaree 44480 (S); East-

Figure 8. Distribution of *Verbena gooddingii* in the United States

Mapping by counties done by Andrew R. Moldenke

wood 18032 (Gg--188960, To, W--1569542), 18353 (Gg--190310); Evenari s.n. [Peach Spring, 5.4.47] (Jr); F. W. Gould 1709 (Ca--882642, N, Tu--13788); Grater 17 (Ca--602833, Tu--31273), 240 (Ca--711778, Du--331843); A. A. Heller 16004 (Ca--725548, N, S, Se--86350); Herb. Range Surveys 119 (Tu--35543); M. E. Jones 50890 (Po--83729), s.n. [Hackberry, 5-24-1884] (Bm, Br, Du--151799, Ob--50862, Po--71258, Ua--11395, W--223793), s.n. [Chloride, April 15, 1903] (Po--71254); Kearney & Peebles 11100 (To, W--1634179), 11118 (To, W--1634189), 12669 (W--1651236); Lemmon & Lemmon s.n. [Peach Springs, June 1884] (Bm, Ca--192064, W--56204); Maguire, Maguire, & Maguire 4995 (Ca--553765, Ua--17041); Mc Clintock 52-370 (Gg--373553); Nelson & Nelson 2776 (Ca--613975, Ur); K. Rechinger 2178 (V); W. H. Rhoades s.n. [south of Kingman, April 1936] (Hs); L. S. Rose 40079, in part (Al); N. C. Wilson 99 (Du--24176, W--669737); Wooton s.n. [Kingman, Aug. 13, 1911] (W--661012), s.n. [Kingman, Mch. 11, 1912] (W--663952). Navajo Co.: Nodwell 7086 (To). Pima Co.: R. S. Beal s.n. [Bear Canyon, 12 April 1948] (Ca--942533); L. D. Benson 11096 (Po--267646); Brass 14174 (N, Pl--105637), 14200 (N); F. R. Fosberg 7910 [905] (La, Po--184952); Goodding 414-45 (Tu--33601); E. H. Graham 3638 (Cm, Du--246057); E. W. Graham 7-9-6 (Cm); Griffiths 4435 (W--496229); Hanson & Hanson A.1021 (Bl--42305, Up--80475); C. B. Maguire s.n. [March 24, 1935] (N, Pl--130551, Ua--47434); Mrs. G. Mairs s.n. [Ajo, April 1916] (Tu); Markland 149 (Au); Mearns 2677 (Gg--31462); Nelson & Nelson 1364, in part (Ca--580303, Pl--82322, S), 1429 (N, N, Ua--23759), 1543 (Ca--882577); K. F. Parker 5913 (Gg--341901, N); Peebles 11332 (To, W--1634239); Spalding s.n. [March 20, 1906] (Tu--32399); Thackery 90 (I, W--1469239); Thackery & Leding 1100 (W--1326921); J. J. Thornber 5169 (Ca--882361); Tidestrom 12496 (I); Zuck s.n. [Tucson, May 16, 1896] (N, W--349024, W--664468). Pinal Co.: E. H. Graham 3343 (Cm); Loomis 835 (To); Peebles 6852 (Gg--184986, Gg--192657), 9186 (To, W--1624255); J. J. Thornber s.n. [Oracle, May 12, 1905] (Ok, Ur), s.n. [Oracle, May 28, 1905] (Tu); Toumey s.n. [Galiuro Mts., July 29, 1894] (Ca--171597); Wiegand, Maguire, Richards, & Moeller 10345 (N, N, Pl--130556, Ua--47413). Santa Cruz Co.: L. D. Benson 10965 (Po--267649); Eastwood 17772 (Gg--175071); Epling & Stewart s.n. [Patagonia, Sept. 4, 1936] (Ca--882570); F. R. Fosberg 7912 [917] (La, N, Up); Goodding 76-52 (Ca--39354); G. Lindsay 1164 (Du--259233); S. W. Hutchinson s.n. [May 1929] (En--960); Nelson & Nelson 1476 (Ca--882639, Pl--82321, Se--16876, Ur); Newlon 653 (Ca); Tidestrom 744 (I), 772 (W--506969). Yavapai Co.: Barkley & Blondeau 4285 (Mn--35082); Cantelow s.n. [May 1, 1942] (Gg--317971); Comstock C.723 (Ak--12634); Crooks & Darrow s.n. [Con-gress Junction, April 19, 1938] (Tu--35542); Deaver 2805 (Fg--4548); O. Degener 4532 (Ms, N); Demaree 40238 (Ca), 42221 (S), 42494 (Gg), 43883 (S); Eastwood 16699 (Gg--161993); R. S. Ferris 9899 (Ca--882645, Du--282743, Mi, Rs--26905, Se--79002); Fulton 6266 (To); H. S. Gentry 4534 (Ak--25786); J. W. Gillespie 8503 (Ca--475757, Du--219648), 8512 (Du--221442); C. F. Harbison 41178 (Ca--991068); M. E. Jones s.n. [Skull Valley, April 28, 1903] (Po--71252), s.n. [Hillside, May 1, 1903] (Po--71253); W. W. Jones s.n. [Jerome, April 14, 1920] (Ca--407932, W--1568462), s.n. [Skull Valley, June 29, '21] (Ca--407938), s.n. [Jerome Divide, July 25, 1921] (Ca--407931); Kearney & Peebles 9720 (Ca--540263, To, W--1624393); E. B. Kurtz s.n. [Yarnell, July 18, 1937] (Up); Kusche s.n. [Senator, Aug. 1, 1917] (Gg--31275); Loomis 3234 (La); Mrs. C. W. McKelvey s.n. [June 4, 1929] (Gg--170335); Miranda & Deaver 5785 (Ca); A. Nelson 10228 (Ca--500826, Mg--32, S); C. L. Porter 2816 (Pl--117765); Shreve 4852 (Fs); Spangle & Goodwin 100 (Fg--3123); Tidestrom 898 (S, W--506690); Toumey 305 (Tu), 305a (W--212336), s.n. [Camp Verde, Aug. 7, 1891] (Tu); Whiting 1053 [cat. 4880] (To); Yarnell 52 (Fg--8110). Yuma Co.: Bailey & Bailey 10059 (Ba); Benson & Darrow 18068 (Po--267645); Newlon 574 (Ca); Edw. Palmer 340 (Pa); J. M. Tucker 2874 (Z). County undetermined: Edw. Palmer 339, in part [Valley of the Colorado] (Ca--187474, W--56213), s.n. [southern Arizona, 1869] (W--56214); T. E. Wilcox 26 (W--213176); N. C. Wilson s.n. [Northern Arizona, 1893] (Ca--158840). CALIFORNIA: San Bernardino Co.: A. M. Alexander 426 (Ca--625571), 1332 (Ca--666269); M. Beal 251 (Mv), s.n. [Cedar Canon, May 11, 1932] (Ca); K. Brandegee s.n. [Barnwell, May 15, 1911] (Ca--162007), s.n. [Cima, June 1915] (Ca--204980); T. S. Brandegee s.n. [Providence Mts., May 26, 1902] (Ca--124663); J. G. Cooper s.n. [summit of Providence Mts., May 29, 1861] (W--322402); R. S. Ferris 7455 (Du--194816); Ferris & Bacigalupi 8135, in part (Ca--496317, Du--213029, Ob--68410, Po-203435, Rs--8397); Jaeger s.n. [Clark Mtn., 6-22-1930] (Po--179284), s.n. [n. end of Clark Mtn., Oct. 31, 1931] (Po--180135, s.n. [3-20-1932] (Mn--20492), s.n. [Vanderbilt, March 1932] (Po-187839); Jepson 5491 (Ca), 6147 (Ca), 18244 (Ca); E. R. Johnson 962 (Ca--484190, Du--216384, Rs--1571), s.n. [May 12, 1928] (Gg-165913); Munz 12860 (Ca--495246, Mn--20538, Ob--50790, Po--184011, S); Munz, Johnston, & Harwood 4254 (Ba, Du--123238, It, Po--9671, Se--15964); Edw. Palmer 339, in part (Pa); S. B. Parish 10320 (Du--91126); Peirson 8737 (Gg--178435), s.n. [April 16, 1930] (En--1905); C. B. Wolf 3292 (Du--283164, Rs--5045, Se-58342, W--1845814), 7021 (Ca--718172, N, Rs--16253), 9680 (Gg--381244, N, Rs--23527), 10718 (Ak--14945, Ca--774739, Ok, Rs--

24589); *Wolf, Johnson, & Everett 8281* [prop. no. 2637] (Ok, Rs--17925). MEXICO: Baja California: *Orcutt s.n.* [7-25-1883] (Cm). Sonora: *Abrams 13193* (Du--213519), *13396* (Du--213611); *T. S. Brandegee s.n.* [Las Durasnillas, May 18, 1892] (Ca--171660); *F. R. Fosberg 7911* [915] (Du--217931, Po--183231, Po--184936); *H. S. Gentry 3559* (Ge); *C. T. Mohr s.n.* [Plains of Sonora, 20-29-80] (W--771874). CULTIVATED: California: *Balls 8712* (S), *10218* (Bm); *Munz & Everett s.n.* [Balls 10218] (S); *Walther s.n.* [Santa Monica, July 10, 1929] (Gg--165710), *s.n.* [Santa Monica, June 1930] (Gg--178752). LOCALITY OF COLLECTION UNDETERMINED: *Collector undesignated s.n.* [Partridge Creek, April 26] (W--71929); *Edw. Palmer s.n.* [southern Utah, northern Arizona, etc., 1877] (Io).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr., Proc. Biol. Soc. Wash. 38: 15 [as "*gooddingii nepetifolia*"]. 1925.

Synonymy: *Verbena arizonica* Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 102--103. 1907 [not *V. arizonica* A. Gray, 1883]. *Verbena verna* A. Nels., Am. Journ. Bot. 18: 436--437. 1931. *Verbena bipinnatifida* var. *nepetifolia* (Tidestr.) Jepson, Fl. Calif. 3 (2): 383. 1943. *Verbena ciliata* var. *nepetifolia* Tidestr. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. *Verbena goodingii* var. *nepetifolia* Tidestr. ex Moldenke, Résumé 364, in syn. 1959. *Verbena gooddingii nepitifolia* Tidestr. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. *Verbena goodingii* subsp. *nepetifolia* Rides. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. *Verbena goodingii nepetifolia* Tidestr. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. *Verbena gooddingii nepetaefolia* Tidestr. ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 102--104. 1907; Prain, Ind. Kew. Suppl. 4: 245. 1913; Tidestr., Proc. Biol. Soc. Wash. 38: 15. 1925; A. Nels., Am. Journ. Bot. 18: 436. 1931; Perry, Ann. Mo. Bot. Gard. 20: 249, 311, 323, 337--338, 340, & 355. 1933; Hill, Ind. Kew. Suppl. 9: 295. 1938; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Prelim. Alph. List Invalid Names 44 & 49. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 11, 18, & 101. 1942; Moldenke, Alph. List Invalid Names 45 & 51. 1942; Jepson, Fl. Calif. 3 (2): 383. 1943; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke. Phytologia 2: 75 & 115. 1945; Moldenke, Alph. List Cit. 1: 116, 121, 178, 193, 200, 208, 234, 244, 255, & 256. 1946; Moldenke, Phytologia 2: 383. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Moldenke, Alph. List Cit. 2: 399, 438, 457, 471, 472, 477--479, 483, 488, 489, 494, 497, 498, 513, 518, 522--524, 527, 550, 595, 597, 598, 606, & 618 (1948), 3: 666, 698, 701, 720, 723, 724, 755, 779, 792, 794, 803, 831, 843, 933--935, 953, & 976 (1949), and 4: 983, 984, 989, 1004, 1086, 1121, 1125--1127, 1155, 1181, 1191, 1198, 1203, 1225, 1227, 1239--1245, 1247, 1252, 1290, 1294, 1298, & 1299. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 19, 20, 26, 27, 33, & 198. 1949; Moldenke, Am. Wild Fls. 292 & 450. 1949; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; B. H. Johnson, Wasmann Journ. Biol. 16: 295. 1958; Moldenke, Résumé 24, 25, 32, 33, 39, 358, 362, 364, 378, 418, & 471. 1959; Lewis & Oliv., Am. Journ. Bot. 48: 639. 1961; Moldenke, Résumé Suppl. 3: 8 & 38 (1962) and 6: 10. 1963.

This variety differs from the typical form of the species in having the leaf-blades broadly ovate, coarsely and unevenly dentate, at times lobed, and abruptly narrowed into a cuneate base, and the pubescence varying from strongly pilose to densely villous.

This is a perennial, fragrant, bushy herb, to 0.5 m. tall, often forming clumps to 1 m. in diameter, spreading-erect from the base; stems stout, subobtusely angular, branched, softly spreading-pubescent, the long hairs intermixed with small short-stipitate glands; branches ascending; principal internodes elongate, about 8 cm. long; leaves decussate-opposite; petioles 1--1.5 cm. long, alate; leaf-blades broadly ovate, gray-green on both surfaces, about 3 cm. long and 1.5 cm. wide, obtuse at the apex, somewhat deeply crenate-lobed, obliquely narrowed at the base into the petiole, softly pubescent on both surfaces, the lobes 2--7 mm. long, the veinlet reticulation slender, prominulous beneath; inflorescence pedunculate; peduncles to 5 cm. long, softly spreading-pilose; bractlets lanceolate, shorter than the calyx, softly spreading-pilose with coarse hairs; flowers fragrant, corymbose during anthesis, the corymbs to 2.5 cm. wide, the spikes greatly elongating after anthesis and then to 6 cm. long and 1.5 cm. wide; calyx oblong-cylindric, about 5 mm. long, gray-green, spreading-pilose throughout, the tube eventually angulate, the teeth subequal, short, 1--2 mm. long, lanceolate from a broader base; corolla hypocrateriform, showy, varying from rose, pink, pale-pink, or pinkish-blue to pale-violet, pale-lavender, lavender, lavender-pinkish, or lavender-blue, usually pink or rose when fresh and fading to magenta or blue, or deep-pink fading to lavender, drying white, its tube not at all or only slightly exserted from the calyx, greenish-white at the summit, puberulent in the throat, the limb subequally 5-lobed, 8--9 mm. wide, the lobes obovate-truncate, 2--3 mm. long, about 2 mm. wide, subemarginate at the apex; stamens scarcely equaling the mouth of the corolla-tube; anther-glands small; pistil scarcely equaling the mouth of the corolla-tube; fruiting-calyx 7--8 mm. long; cocci oblong-elongate, black, about 3 mm. long, the commissure almost smooth; chromosome number: n = 15.

Although Tidestrom published the name of this taxon as a trinomial, where the third epithet normally is taken to represent a subspecies, he says "var. nov." after it, indicating that he intended it to be of varietal status. The type of the variety was collected by Ivar Tidestrom (no. 8835) in El Dorado Canyon, Lincoln County, Nevada, near the Colorado River, at an altitude of 600 meters, on May 2, 1919, and is sheet no. 1221478 in the United States National Herbarium at Washington. The type of V. arizonica was collected by Marcus Eugene Jones (no. 3901) at Yucca, Mohave County, Arizona, on May 14, 1884, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. It should be noted here that the V. arizonica of Gray is a synonym of V. gracilis Desf. The type of V. verna was collected by Norman C. Wilson (no. 95) and is deposited in the Rocky Mountain Herbarium.

The variety has been collected on riverbanks, dry slopes, rocky slopes, and hills, along arid roadsides, in granitic soil on foothills, among granitic rocks, in Prosopis and Simmondsia association, on hillsides, in roadside deserts, on the sides of ravines, on small stream banks in red clay hills, in cultivated fields, narrow canyons, and deserts, on volcanic hills and hillsides, on mesas and gravelly slopes, in washes, sandy washes, and road-cuts, at the edges of sandy washes, in crevices and on ledges of basaltic cliffs, and in red clay of snall stream banks, at altitudes of 400 to 2000 meters, blooming and fruiting from January to November. Hanson found it to be "infrequent on lower foothills" in Pima County, Arizona. Clover reports it as "common" in washes, while Carter, Alexander, & Kellogg encountered it with Lycium and Prosopis in gravelly shallow arroyos. The vernacular name, "moradilla", is reported for it.

B. H. Johnson (1958) calls it "a small shrub, about 2 feet high", but surely this is an error in observation! Ferris 9881 bears a note stating that the flowers are "pale lavender, drying white", while Kennedy states that the flowers are "rose fading to magenta". R. C. Foster says of Harbison & Stover s.n. [Laguna Chapella, May 5, 1939] "somewhat transitional to V. delticola and may be a hybrid". Kearney notes concerning Harrison & Kearney 8592 "gland very small", while of Harrison, Kearney, & Fulton 7591, Peebles, Harrison, & Kearney 317, and Thackery & Leding 1100 & 1120 he says "gland large (or rather large) but much lower and smaller (or shorter) than the anther cells". Rose, Standley, & Russell 12745 & 12745a are mixtures with V. pumila Rydb. The Mearns 159, Edw. Palmer 339, and D. T. MacDougal 603, cited below, were annotated and cited by Perry (1933) as typical V. gooddingii Briq. Strickland 39 bears a note "corolla-tube unusually elongate". Kearney thinks that the Wooton s.n. [Hackberry, Mch. 7, 1912] is "not this variety".

The chromosome complement has been counted by C. R. Bell in material taken from Bell & Newcomb 1356, with an illustration of the condition at diakinesis on the labels. Additional common names recorded for the variety are "alfombrilla", "kamiyo", and "mint".

Herbarium material has been misidentified and distributed under the names V. ambrosiaefolia Rydb., V. ambrosifolia Rydb., V. aublatia Jacq., V. aubletia Jacq., V. aubletia L., V. bipinnatifida Nutt., V. bracteosa Michx., V. canadensis (L.) Britton, V. ciliata Benth., V. delticola Small, V. gooddingii Briq., V. goodingii Briq., V. macdougalii Heller, and V. wrightii A. Gray. On the other hand, the La Rivers & Hancock 401, distributed as var. nepetifolia, is actually the typical form of the species, while Ferris 8770 is V. delticola Small. Jepson makes the amazing statement that this is "a slight leaf form scarcely worthy of a name", while actually it is quite distinct -- and is especially distinct from V. bipinnatifida, of which he made it a variety!

Briquet (1907), in speaking of his V. arizonica, says "Cette espèce est rapportée dans l'exsiccata cité au V. ciliata Benth., lequel en diffère abondamment par ses feuilles profondément tripartites, à segments étroits 2--3-multifides, ses bractées bien plus courtes que le calice, etc. Elle se rapproche par la forme de ses feuilles du V. Aubletia Jacq., mais en diffère complètement par l'indument et l'organisation florale."

Perry (1933) cites the following 17 additional specimens not as yet seen by me: COLORADO: County undetermined: Parry s.n. [southern Colorado, 1867] (W). NEVADA: Lincoln Co.: T. W. Davis s.n. [El Dorado Canyon, 1880] (E). ARIZONA: Mohave Co.: M. E. Jones 3901 (F). Pima Co.: Bartram 257 (D); Beard s.n. [Tucson, 1911] (E); Greenman & Greenman 56 (E); Griffiths 3489 (E); Pringle s.n. [April 13, 1883] (E, F, G). MEXICO: Baja California: Nelson & Goldman 7123a (E); Orcutt 1303 (E, F), 5141 (E, F). Sonora: Goldman 292 (G); Edw. Palmer 307 (G). She comments that "The variety differs from the species in its much less indented and broader leaves. The pubescence is much more variable and at times harsh, suggesting an intergradation with V. bipinnatifida. The leaf-forms recall V. canadensis, but the spike is scarcely distinguishable from V. Gooddingii."

In all, 239 herbarium specimens, including type material of some of the names involved, and [illegible] mounted photographs and clippings have been examined by me.

Citations: UTAH: Kane Co.: Siler s.n. (Up). Washington Co.: Gierisch 403 (N, Ua--47416). NEVADA: Clark Co.: Grater 50 (Ca--710362); G. W. Gullion 477 (Ca--52122); M. E. Jones s.n. [Eldorado Canon, April 30, 1907] (Po--70885); Train 1493 (Ca--900556, Gu--21294, Tu--35540), 2009 (I). Lincoln Co.: Tidestrom 3835 (W--1221473--type). COLORADO: County undetermined: C. C. Parry 551, in part (W--1323045). ARIZONA: Cochise Co.: Herb. Chiricahua Veg.-Study Team 1958-117 (Am); Hobbs s.n. [4/25/44] (Or--52110); W. W. Jones s.n. [near Bisbee, Sept. 13, 1922] (Ca--407930, Po--194003); J. G. Lemmon s.n. [Huachuca Mts., Aug. 1882] (W--56178); W. F. Parish 197 (Du--90838). Coconino Co.: Clover 6078 (Mi); Collector undetermined s.n. [Sitgreaves Peak, March 25] (W--56215). Mohave Co.: Barneby 2726 (N); Cantelow s.n.

[April 29, 1942] (Gg--316104); E. S. Clark s.n. [near Needles, Feb. 1886] (Gg--31464); Clover 6062 (Mi); Eastwood 18406 (Gg--138961); Epling & Robison s.n. [Battleship Rock, 17-VI-1935] (La); R. S. Ferris 9881 (Ca--882641, Du--278081, Mi); Grater 75 (Ca--711770); Harrison, Kearney, & Fulton 7591 (To); M. E. Jones 3901 (Br, F--photo, Fg--9529, Gg--130525, Gg--154425, N--photo, N--photo, Ob--50789, Pa, Po--71251, Si--photo, Tu, Ua--11394, W--223819, Z--photo, Z--photo); Lickty s.n. [Scott's Well, May 1, 1938] (Sd--21179); C. B. Maguire 21400 (Gg--295128, N, N, Ua--47399), 21403 (N, N, Pl--130555, Ua--47400); Munz 11691 (N), 14973 (Po--229685); F. M. Reed s.n. [April 22, 1936] (Po--218616); Thackery 348 (Du--299095, I, N, W--1469240); N. C. Wilson 95 (Ca--158839); Wooton s.n. [Hackberry, Mch. 7, 1912] (W--663953). Pima Co.: Abrams 13118 (Du--213475, Ob--50765); Bartram 257 (W--1071595); W. C. Bryan 27 (Au); O. M. Clark 11168 (Ok), 11428 (Ok); Collector undesignated s.n. [Tumamoc Hill, 3/21/32] (Tu); A. Conrad s.n. [Tucson, April 25, 1915] (Tu); N. C. Cooper C.724 (Ak--12633); J. H. Ehlers s.n. [April 1, 1939] (Ur); Ehlers & Ehlers 7230 (Mi); F. R. Fosberg 7910 (En, Up); Gilman 36 (I); Goodding 414-45 (Or--55752); Gould, Darrow, & Haskell 3007 (Tu--20526); E. H. Graham 3430 (Cm, Du--246093), 3505 (Cm, Du--246094); H. W. Graham 8-15-30 (Cm), 8-5-37, in part (Cm); Griffiths 2421 (N), 2583 (N), 3489 (W--495815), s.n. [near Tucson, 1900] (N); Gustafson s.n. [Tucson, Jan. 8, 1932] (I); Hanson A.344 (Ur); J. A. Harris C.16375 (N); Harrison & Kearney 3646 (W--1367449), 8592 (To); Mrs. W. Hough s.n. [Sabina Cañon, April 4, 1896] (W--349022); Kearney & Peebles 10842 (N, To); D. D. Keck 3936 (Ca--579718); Loomis & Thackery 910 (W--1326835); L. H. Pammel s.n. [Desert Lab., Jun. 9, 1926] (Io--119278); S. B. Parish s.n. [Tucson, 1901] (Po--88303), s.n. [Tucson, 1909] (Du--89504); Peebles 6755 (N), 9299 (To); Peebles & Fulton 11445 (To); Peebles, Harrison, & Kearney 317 (To, W--1287281); Pringle s.n. [April 13, 1881] (Pa, Up--17086, Vt); J. N. Rose 11968 (W--454635); Rose, Standley, & Russell 15176 (N, W--638051), 15181 (N, W--638056); Rothrock s.n. [Tucson, 1871--5] (W--771873); Shreve 5169 (Fs), 7352 (Fs, Me, Me, Mi, Rs--14852); M. F. Spencer 92 (Ca--472934, Mg--55, Mg--56, Ob--50857, Ur), s.n. [5/1922] (Ob--50858); Stiffler s.n. [vicinity of Tucson, 1925] (It); Strickland 89 (Gg--399287); L. Swingle S.69 (Tu); Thackery & Leding 1100 (To), 1120 (To); Thackery & Loomis 910 (To); Toumey s.n. [Sabina Cañon, Apr. 4, 1896] (W--664135); G. R. Vasey s.n. [Tucson, Mar. 1881] (W--155630), s.n. [Tucson, 1881] (W--56205); Wiegand, Maguire, Richards, & Moeller 10730 (N, Ua--47415), 10758 (N, N, Ua--47414); Wiggins 6519 (Ca--528072, Du--226245, Mi, W--1684632). Yavapai Co.: Crosswhite 515 (Hi--194696); Fernow s.n. [Camp Verde to

Prescott, Aug. 1896] (W--859019); Goodding 26-47 (Ca--39331, S); Mearns 159 (N). Yuma Co.: J. F. Brenckle 51125 (Le); McDougall s.n. [2-3-41] (Tu--26858); Peebles & Loomis 6757 (Gg--192655); Toumey s.n. [Camp Verde, Aug. 7, 1891] (Ca--882640). County undetermined: Kohler s.n. (Ur--17455); D. T. MacDougal 603 (Au, N); Mrs. F. Stephens s.n. [Little Meadows, June 22, 1902] (Ca--139761); G. R. Vasey s.n. (Ka). CALIFORNIA: San Bernardino Co.: M. E. Jones s.n. [Clark Mts., E. Mohave Desert] (Ca--537247); Edw. Palmer 339, in part (C); Tallant s.n. [Lanfair, March 1914] (Ca). County undetermined: N. C. Wilson 37 [Pinte Creek] (Ca--158841). MEXICO: Baja California: Bell & Newcomb 1356 (Ld, Ld, Le, N, W--2130805); T. S. Brandegee s.n. [Feb. 12th, 1889] (Du--24175), s.n. [Agua Dulce, May 16, 1889] (Ca--104812), s.n. [Vallederos Ck., May 4, 1893] (Ca--104813); Carter, Alexander, & Kellogg 1885 (Ca--916142, W--2034361); K. L. Chambers 729 (Du--406304); R. J. Ferris 8574 (Du--229065, W--1686956); Hammerly 432 (Du--295383, Gg--294855, W--1896177); C. F. Harbison 27283 (Ak--12911), s.n. [April 30, 1940] (N); Harbison & Stover s.n. [Laguna Chapella, May 5, 1939] (Sd--25262); G. Lindsay s.n. [July 10, 1937] (Du--259287); Meling 6 (Du--225541, W--1635285), 12 (Du--225544, Po--209971, W--1635291); Nelson & Goldman 7123a (W--565210); C. R. Orcutt 670 (Ca--104884), 1303 (C, Ca--25143, Mn--11967, Pa), 541 (N), s.n. [10-5-1882] (W--1323076), s.n. [Piñone Forest, 10-6-1882] (W--56177), a.n. [Rosario, 5.3.1886] (Ca--192069, Dt, Mi), s.n. [near Rosario, 5-4-1886] (Al); Purpus 206 (Ca--104874); Raven, Mathias, & Turner 12605 (Ca--171729); J. Whitehead 779 (Du--248591); Wiggins 4411 (Du--259477), 4411a (W--1739794), 5289 (Ca--660799, Du--265428, Gg--305089, Mi, N, Po--261851, Se--82528, W--1824003), 9146 (Du--258595, W--1747508). Nuevo León: Arsène s.n. [Monterrey, 5-1911] (N); Edwards & Eaton s.n. [Monterey, 1846] (T); Safford 1274 (W--573322). Sinaloa: J. G. Ortega 4541 (W--1084147); Rose, Standley, & Russell 13449 (N, W--535272). Sonora: R. S. Ferris 8770 (Du--229060, N); F. R. Fosberg 7911 (Up); Frye & Frye 2310 (N, Se--65803); H. S. Gentry 356 (Du--263866); Goldman 292 (N, W--335789); Goodding 952 (W--661707); P. B. Kennedy 7033 (Ca--373594, Du--217703, Gg--187785, W--1287204); MacDougal 73 (W--574274); Mearns 1904 (Du--24196, W--232443), 1914 (Du--24197, W--232672); R. Moran 4028 (Du--361696); Edw. Palmer 307 (W--56203); Rose, Standley, & Russell 12745, in part (W--635561), 12745a (N), 12840 (N, W--635660); Shreve s.n. [Apr. 8, 1932] (Cm); Studhalter 1349 (W--1685673); Wiggins 6382 (Du--253442, W-1739923), 7171 (Du--251391), 7225 (Ca--666016, Du--261497, Rf, W--1747238), 8201 (Du--264452, Mi, W--1824373), 11775 (Ca--93153, W--2264369). MOUNTED CLIPPINGS: Proc. Biol. Soc. Wash. 38: 15. 1925 (W, W).

xVERBENA GOODMANI Moldenke, Phytologia 6: 330. 1958.

Bibliography: Moldenke, Phytologia 6: 330. 1958; Moldenke, Résumé 26, 365, 375, & 471. 1959.

This is a natural hybrid between *V. stricta* Vent. and *V. halei* Small, with intermediate characters. The leaves are variously incised and lobed as in *V. halei*, but are densely canescent-pubescent beneath and to 7 cm. long and 4.5 cm. wide. The stems and branches are densely canescent-pubescent, as are also the peduncles, rachids, and calyxes. The spikes are very numerous and very slender, to 30 cm. long, with overlapping calyxes, very sparsely fruited.

The type of this hybrid was collected by George Jones Goodman (*no. 6474*) -- in whose honor it is named -- along a roadside 3 miles north of Willis, Marshall County, Oklahoma, on June 28, 1957, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York. The collector notes that the hybrid is infrequent or occasional among the two parents. It has been found in sand and on grassy ground, flowering from June to August. Herbarium material has been misidentified and distributed under the names *V. blanchardi* Moldenke and *V. simplex* x *stricta* Gates. In all. 20 herbarium specimens, including the type, have been examined by me.

Citations: OKLAHOMA: Marshall Co.: *Alder s.n.* [July 10, 1950] (Ok); *G. J. Goodman 5418* (Ok), *5749* (Ca—81915, Ok, Ur, Ur), *6474* (Bi--isotype, Ca--isotype, Fg--isotype, S--isotype, Z--type, Z--isotype, Z--isotype), *6481* (Bm, Gg, Mi), *6517* (Bs, Mm, Ok, Sm).

VERBENA GOYAZENSIS Moldenke, Bull. Torrey Bot. Club 77: 404. 1950.

Bibliography: Moldenke, Bull. Torrey Bot. Club 77: 404. 1950; Moldenke, Revist. Sudam. Bot. 8: 168. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 110 & 471. 1959.

Herb, about 1.5 m. tall; stems coarse, obtusely tetragonal, deeply 4-sulcate between the angles, rather densely scabrous-pubescent with short whitish hairs; nodes annulate; principal internodes 1.5--5 cm. long; leaves decussate-opposite, sessile; leaf-blades firmly chartaceous but fragile, grayish-green on both surfaces, elliptic, 3--5 cm. long, 1.2--2 cm. wide, acute at the apex and base, regularly serrate with rounded revolute-margined teeth, very scabrous-pubescent above (the hairs soon deciduous, leaving the lamina white-pustulate) and subbullate, appressed-pubescent on the venation beneath; midrib slender, impressed above, very prominent beneath; secondaries slender, 5--7 per side, ascending, not arcuate, impressed above, very prominent beneath; vein and veinlet reticulation very abundant, deeply impressed above and very prominent beneath; inflorescence terminal, paniculate; peduncles aggregate in groups of 4—6, slender, 2.5--34 cm. long, irregularly glandular-pubescent, its branches similar in all respects; floriferous spikes small, less than 1 cm. long, densely many-flowered, erect; bractlets lanceolate, 2.5--3 mm. long, attenuate at the apex, densely long-strigose and also more or less glandular; calyx about 1 mm. long; corolla very small, red, its tube about 1 mm. long, the limb about 1 mm. wide.

The type of this species was collected by Goro Hashimoto (*no. 663*) at Rio de Peixa, Municipio de Goiás, Goías, Brazil, on August 7, 1949, and is deposited in the herbarium of the Instituto Botanico at São Paulo, Brazil. In all, 3 herbarium specimens, including the type, and 3 mounted photographs have been examined by me.

Citations: BRAZIL: Goías: *Hashimoto 663* (F--photo of type, N--isotype, N--photo of type, Sp--55342--type, Z--photo of type); *Macedo 3858* (W--2248938).

VERBENA GRACILESCENS (Cham.) Herter, Revist. Sudam. Bot. 4: 186--187. 1937.

Synonymy: *Verbena officinalis?* var. *gracilescens* Cham., Linnaea 7: 254--255. 1832. *Verbena officinalis* β Hook. apud Cham., Linnaea 7: 255, in syn. 1832. *Verbena officinalis* β *gracilescens* Cham. ex Schau. in Mart., Fl. Bras. 9: 191. 1851. *Verbena officinalis* var. *gracilescens* Cham. ex Kuntze, Rev. Gen. Pl. 3 (2): 257. 1898. *Verbena officinalis* var. *gracilescens* (Cham.) Kuntze ex Seckt, Rev. Univ. Nac. Córdoba 17: 90. 1930. *Verbena gracilescens* Cham. ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940; Maria, Pl. Vall. Cochamb. 38. 1962. *Verbena officinalis* var. *gracilescens* Hauman-Merck apud Gray Herb. Card Index n. d. [1941 or before]; Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. *Verbena officinalis* var. "b" *gracilescens* (Cham.) Augusto, Fl. Rio Grande do Sul 233, in syn. 1946. *Verbena angustifolia* Lam. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947 [not *V. angustifolia* L., 1941, nor Michx., 1803, nor Mill., 1768]. *Verbena gracilescens* f. *typica* Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena officinalis* var. *gracilescens* Griseb. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. *Verbena officinalis* var. *major* Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. *Verbena officinalis* var. *tenuis* Cham. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. *Verbena gracilescens* (Cham. & Schlecht.) Herter ex Moldenke, Résumé 365, in syn. 1959. *Verbena gracilescens* f. *glabra* Osten ex Moldenke, Résumé 365, in syn. 1959. *Verbena gracilescens* f. *subglabra* Osten ex Moldenke, Résumé 365, in syn. 1959. *Verbena gracilescens* (L.) Briq. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. *Verbena officinalis* var. *minor* Osten ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. *Verbena gracilescens* Cham. & Schlecht. ex Moldenke, Résumé Suppl. 6: 10. 1963.

Bibliography: Cham., Linnaea 7: 254--255. 1832; Griseb., Abh. K. Gesell. Wiss. Götting. 24 [Symb. Fl. Argent.] 276. 1879; Lorentz & Niederlein, Exped. Rio Negro 2 (Bot.): 264. 1881; Lillo, Fl. Tucuman 94. 1888; Kuntze, Rev. Gen. Pl. 3 (2): 257. 1898;

Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: 72]. 1902; Chod., Bull. Herb. Boiss., sér. 2, 2: 817. 1902; Chod., Plant. Hassler. 9: 196. 1902; Hicken, Chloris Plat. Argent. 197. 1910; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 414. 1913; Hicken, Physis 2: 114. 1916; Seckt, Rev. Univ. Nac. Córdoba 17: 90, pl. 18, fig. 486. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Gallinal, Bergalli, Campal, Aragone, & Rosengurtt, Stud. Nat. Mead. Urug. 81. 1938; Herter, Revist. Sudam. Bot. 6: 97. 1939; Moldenke, Prelim. Alph. List Invalid Names 46. 1940; J. A. Clark, Gray Herb. Card Index [1941 or before]; Ragonese, Darwiniana 5: 413. 1941; Moldenke, Lilloa 6: 328—330 (1941) and 8: 430. 1942; Moldenke, Alph. List Invalid Names 47 & 49. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 19 & 20. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39--41, 44, & 101. 1942; Rosengurtt, Estud. Prad. Nat. Urug. 3: 236 & 237. 1943; Herter, Revist. Sudam. Bot. 7: 225. 1943; Schnack & Covas, Darwiniana 6: 470 & 473. 1944; Moldenke, Lilloa 10: 346—347 & 384. 1944; Schnack & Covas, Bol. Soc. Argent. Bot. 1: 284. 1946; Moldenke, Alph. List Cit. 1: 12, 29, 80, 86, 92, 202, 217, 219, & 296. 1946; Augusto, Fl. Rio Grande do Sul 212 & 233. 1946; Rosengurtt, Estud. Prad. Nat. Urug. 5: [Fl. J. Jackson] 394. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22, 24, & 26. 1947; Moldenke, Phytologia 2: 338. 1947; Ragonese & Covas, Darwiniana 7: 445, 451, 455, & 487. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Castanea 13: 119. 1948; Moldenke, Alph. List Cit. 2: 358, 364, 371, 374, 375, 378, 380, 426, 458, 532, 533, 537, 575, 586, 599, 627, & 628 (1948), 3: 662, 672, 673, 732, 733, 745, 749, 765, 767, 780, 781, 804, 859, 862, 869, 876, 907, 911, 913, 923, 931, & 966 (1949), and 4: 984, 1010, 1072, 1082, 1087, 1088, 1090, 1091, 1100, 1166, 1168, 1194, & 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 98--100, 106, & 198. 1949; Rosengurtt, Lilloa 20: 139. 1949; Cabrera, Lilloa 20: 175 & 328. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Phytologia 3: 135 (1949) and 3: 377. 1950; Martinez Crovetto & Piccinini, Revist. Invest. Agric. 4: 178 & 226. 1950; Moldenke, Phytologia 4: 121. 1952; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 110, 115, 118, 119, 127, 357, 364, 365, 371, & 471. 1959; Maria, Pl. Vall. Cochabamb. 38. 1962; Moldenke, Résumé Suppl. 3: 14, 38, & 40 (1962), 4: 17 (1962), and 6: 10. 1963.

Illustrations: Seckt, Rev. Univ. Nac. Córdoba 17: pl. 18, fig. 486 [as V. officinalis]. 1930.

Annual, biennial, or perennial and suffrutescent, branching herb, 20 cm. to 1 m. tall; leaves decussate-opposite, the blades rarely linear; flowers small or very small, in loose spikes, the corolla varying from light-blue, pale-blue, blue, bluish, clear-blue, dark-blue, rose-blue, lilac-blue, or violet-blue to violet, clear-violet, pale-violet, bright-violet, dark-violet, violet-rose, lilac, clear-lilac, blue-lilac, or purple, occasionally white; chromosome number: 2n = 42.

The species has been found by collectors inhabiting wet meadows and fields, the shores and banks of rivers, wet places along the edges of streams, the edges of ditches and of cultivated fields, stony places, thickets, and the edges of woods. It has been collected at the edge of arroyos and of montes, among grasses on river shores, on hillsides, pampas, and dry plains, in woods, bushy woods, and alfalfa fields, in both cultivated and uncultivated land, in dry soil and in sandy loam in full sunlight, on the high parts of wet meadows, along roadsides through cultivated fields, in tall-grass pajonales, in grassy fields and in sandy soil along riverbanks, among weeds in damp soil, near shrubs on the floor of rocky canyons, in quebradas and damp places, wet places and low fields, wet ground among spiny shrubs, low and cultivated or wet campos, wet hedges, and on dry sunny campos, at altitudes of 40 to 2665 meters. It has been collected in anthesis during every month of the year, and in fruit in August, September, and December.

Meyer says that it is a "weed in cultivated places", and Fries states that it grows in "open grassy places in the region of much rainfall. Schreiter calls it a "planta playera", while Ruiz Leal found it "en alfalfares sucios". Eyerdam & Beetle say that it is "a common weed" in Jujuy, while Cabrera (1949) says of it: "uliginosa frecuente en los bañados pacidos". Ragonese & Covas (1947) say "Planta bienal o perenne, erguida, común en potreros, baldíos, terraplenes, etc." and cite Rosetti, Covas, & Ragonese 4847 and Covas & Ragonese 3774. Ragonese (1941) cites his no. 2058 from Santa Fé; Augusto (1946) cites a Sellow s.n. from Uruguay and a Kadletz s.n. from Rio Grande do Sul. Rosengurtt (1943) says "Hierba hemicriptófita, florece de fines de primavera a principios de otoño. Habita prados uliginosos, intersticicios de rocas, claros de bosque; es escasa y desaparece en los campos muy trabajados."

Chamisso's original discussion (1832) of this plant is worth repeating here: "E Montevideo misit Sellowius. Ab europaea stirpe potissimum diversa: gracilitate caulium filiformiumque ramorum, tenuitateque omnium fructificationis partium subdimidio minorum, foliis ambitu saepius lanceolatis inciso-dentatis, rarius laciniatis trifidisque, dentibus laciniisque integerrimis acutis, floralibus lineari-lanceolatis integerrimis, fructu dimidio minori, intensius ferrugineo, pariter nervoso, at veryice minus rugoso seu reticulato. — Rhizoma lignescens. Caules erecti, subsesquipedales, fastigiatim ramosissimi; ramis provectiori aetate maxime evolutis spicas primarias alares superantibus. — Forsitan diversa: noluimus infirmam hujus vilioris gregis proponere speciem. Confer. Hook. bot. misc. 2 p. 16. V. officinalis β, quae cum genuina in campestribus Americae australioris proveniens, foliis ut nostra, nec vero gracilitate et tenuitate partium differre dicitur."

Common names recorded for the species are "camaradinha", "formosa sem dote", "jurubepa", "yerba de la golondrina", "yerba de Santa Ana", and "yerba de Santa María". On Fries 27 a note states that the flowers were "white or pale-blue"; white-flowered specimens are also represented by Eyerdam & Beetle 22553 & 22577, Sota 35, Venturi 5504, and Wall & Sparre s.n. [12/11/46]. Lillo describes his no. 11996 as "forma foliis strigosis". Archer 4627 has linear leaves, perhaps because the plants were chewed off by grazing animals and the specimens represent second growth; it was collected on the banks of the Río Paraná. J. West 8281 is a mixture with V. parvula Hayek. The species is said to be mentioned by Martinez Crovetto & Piccinini in Revist. Invest. Agric. 4: 30 & 78 (1950), but this is not true, nor does this name or "Verbena officinalis β" appear in Hook., Bot. Misc. 2: 16 (1831) as it claimed in the literature.

Herbarium material of V. gracilescens has been misidentified and distributed by various collectors and museum workers under the names V. caracasana H.B.K., V. ephedroides Cham., V. filicaulis Schau., V. intermedia Gill., V. litoralis H.B.K., V. litoralis var. caracasana Briq., V. littoralis Kunth, V. littoralis var. caracassana Briq., V. officinalis L., and V. polystachya H.B.K. On the other hand, the Jörgensen 3767, distributed as V. officinalis var. gracilescens, is actually in part V. brasiliensis Vell. and in part V. litoralis H.B.K.

It should be noted that the V. angustifolia of Linnaeus and of Michaux are V. simplex Lehm., while that of Miller is Stachytarpheta angustifolia (Mill.) Vahl. Bang 1058 was identified as V. polystachya by Rusby in his published list of collections. The Herb. Herter 95525, previously reported as V. gracilescens, is actually V. litoralis H.B.K., while A. Stewart 3317 is V. glabrata H.B.K.

Verbena officinalis var. minor is based on Osten 3333 from Dayman, dept. Salto, Uruguay, collected on October 18, 1896, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Montevideo, and later described by Osten as "Verbena gracilescens Cham. forma foliis strigosis subforma minor, floribus obscure violaceis." His V. gracilescens f. typica is based on Osten 3936 from the shores of the Río Y near Durazno, dept. Durazno, Uruguay, collected on November 7, 1899, and deposited in the same herbarium, described by him as "foliis subtus in nervis strigis obsitis, fl. pallide violaceis." His V. officinalis var. major is based on Osten 3334 from Dayman, dept. Salto, Uruguay, collected on October 18, 1896, deposited at Montevideo, and described by him at first as "foliis glaberrimis", but later as "V. gracilescens Cham. forma foliis subtus parce strigosis, fl. obscure violaceis." The type of V. gracilescens f. subglabra was collected by Miguel Lillo (no. 10692) in cultivated campos around the city of Tucumán, dept. Capital, Tucumán, Argentina, at an altitude of 450 meters, in October, 1910, and is deposited in the same Montevideo herbarium, while that of V. gracilescens f. glabra was collected by Teodoro Rojas at Villa Encarnacion, on the shore of Río Alto Paraná, Paraguay, and is also deposited at Montevideo.

Hauman-Merck (1913) cites his no. 347 from Río Negro, Argentina, while Martinez Crovetto & Piccinini (1950) cite their no. 4729 from Entre Ríos. Maria (1962) cites his no. 173/4a from Cochabamba. Martinez Crovetto & Piccinini describe the plant as "Hemicriptófita con flores lilacinas y ramas erguidas, frecuente en los palmares del oeste y centro de Entre Ríos; se trata de una especie muy común en casi todos los bosques en galería de la región mesopotámica. La floración se produce en verano."

In all, 256 herbarium specimens, including the types of most of the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Rambo 4152 (Rb), 30975 (N). Santa Catarina: Reitz 3287 [Herb. Reitz 5006] (Le, S, S, W--2027830). São Paulo: Tamandaré & Brade 6692 [Herb. Brade 6692] (N, Sp--6723). State undetermined: Sellow s.n. [Brasilia] (Br). BOLIVIA: Cochabamba: Asplund 4067 (S, Us); Buchtien 2414 (W--1159361); Cárdenas 2390 (N, W--1878099); Julio II.205 (W--1542913); Mrs. R. S. Shepard 254 (Gg--31402, N, W--1197308). Tarija: Pflanz 2131 (W--1234360); J. West 8281, in part (Ca--565124). Province undetermined: M. Bang 1053 [Bolivian Plateau] (Bm, C, Pa, W--71999, W--1416741); Steinbach 1614 [Herb. Inst. Miguel Lillo 31419] (N). PARAGUAY: Fiebrig 4432 (Bm, W--1159389); Hassler 2585 (Ca--929415), 3391 (N), 7593 (Ca--944364, N); Herb. Herter 34341 (N, N); Kuntze s.n. [Concepcion, IX.92] (N); Morong 1014 (C, C); Pedersen 1200 (W--2122710), 3984 (W--2283351), 4072 (W--2283664); T. Rojas 357 (Bm, S), 1668 [Herb. Osten 8568; Hassler 1668] (N, S, Ug), 1888 [Herb. Hort. Parag. 10058; Herb. Osten 13550] (Ug), 2526 [Herb. Osten 18133] (N, Ug), 10853 (N), s.n. [Herb. Osten 7903] (Ug), s.n. [Herb. Osten 13550] (N, S), s.n. [Herb. Osten 13556] (S). URUGUAY: Arechavaleta 39, in part (Ug), 40 (Ug); Berro 39 (Ug), 4115 (N), 3424 (N); Castellanos s.n. [Herb. Inst. Miguel Lillo 11767] (N, N), s.n. [Herb. Inst. Miguel Lillo 15781] (N, N); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1710 (N); Herter 1053 [Herb. Herter 32656] (B, Ca--343971, N, N, N, S, W--1422056), 1861a [Herb. Herter 99314] (B, Bw, N, W--1934877), 50890 (N), 83241 (N), s.n. [Herb. Osten 13490] (S, Ug), s.n. [Herb. Osten 13491] (Ug), s.n. [Herb. Ostan 13499b] (Ug); Legrand 570 (Ug), 2008 (Ug), 2370 [Isla de Pichón] (Ug), 2572 (Ug), 3428 (Ug); Osorio 1008 (Ug--13217); Osten 3333 (Ug), 3334 (Ug), 3936 (Ug), 21700 (S, Ug), 21713 (Ug); Rosengurtt & Gallinal 5803 (N, Ug--14212, W--1908543); W. E. Safford 90 (W--922260); Schröder 117 [Herb. Osten 19911] (Ug); Hugh H. Smith 32 (W--1193735); Wetmore 877 (W--1066026). ARGENTINA: Buenos Aires: Burkart 4330 [Herb. Osten 22469] (Ug), 10062 (Ca--3437); Cabrera 1605 [Herb. Osten 22236] (Ug), 5704 (N); Lanfranchi 460 (N);

Miers 734 (W--1343919); Sota 85 (N); J. Tweedie s.n. [Buenos Ayres] (Bm); Venturi 59 [Herb. Inst. Miguel Lillo 31418] (N, S). Catamarca: Venturi 7160 (Gg--161368). Chaco: R. M. Aguilar 532 (Es, N); Jörgensen 2467 [Herb. Inst. Miguel Lillo 31430; Herb. Osten 11874] (N, Ug, W--1055177); T. Meyer 514 [Herb. Osten 22698] (Ug); Rodrigo 2537 (N); T. Rojas 12038 [Herb. Inst. Miguel Lillo 107795](Ca--164357); A. G. Schulz 1487 (N), 1886 (N). Córdoba: Castellanos s.n. [Valle de los Reartes; Herb. Osten 15285] (Ug); Cozzo s.n. [Barrio Jardin, Oct. 1946] (N); Galander s.n. [Córdoba, 15.XI.1879] (N); Hieronymus s.n. [Córdoba, X.1819] (Br); Hunziker 6318 (N, Si); Lorentz 113 (Br), s.n. (Sg--68312); Troncoso 316 (N, N); J. J. Valencia s.n. [Herb. Inst. Bot. Darwinion 16064] (N, N); Villafañe 172 (N). Corrientes: Ibarrola 1901 (S, W--2049624), 2169 (S); Rodrigo 665 (N). Formosa: I. Morel 104 (N), 1129 (N); Pierotti 4076 (Bm), 4256 (N). Jujuy: Eyerdam & Beetle 22553 (Ca--655647), 22577 (Ca--655659); R. E. Fries 27 (N, S); Garolera & Romero s.n. [Laguna Tala, 10-I-1947] (N); Venturi 4893 (Ca--376027, Gg--158246, W--1591450), 5380 [Herb. Osten 20799] (Ca--376213, E--960421, Gg--158660, N, Ug, W--1440827). La Rioja: Cuezzo 1006 (N). Mendoza: Née 4 (Q); Ruiz Leal 1018 (N), 3057 (N), 8099 (N), 8434 (N), 8948 (N). Misiones: Archer 4627 (H--67940, W--1691996); Bertoni 2461 (N); D. Rodriguez 69 [Herb. Inst. Miguel Lillo 31425] (N, W--1802571); G. J. Schwarz 1294 (N, St). Río Negro: W. Fischer 203 (Cm, N, Ur, W--704396). Salta: Burkart 13192 (N); R. E. Fries 577 (S); Lillo 10996 [Herb. Osten 8464] (Ug); D. Rodriguez 144 [Herb. Inst. Miguel Lillo 31420] (Ca--3320, N, Ug--4941, W--1858261); Schreiter 11466 (Ca, N); Sparre 1269 (S); Venturi 5471 (Gg--159311), 5504 (Bm, Gg--159153, N, N, N, S, V--2767, Vi, W--1442820, W--1591474); Wall & Sparre s.n. [Río Calderas, 5/12/46] (Ew); Willink 72 (S). San Juan: Cuezzo 1285 (N), 1321 (N), 1441 (N). San Luis: Cuezzo 2238 (N); J. D. Varela 452 (N, Ok, Rf). Santa Fé: Balegno 495 (N); Burkart 5807 (N, N), 9083 (W--1858301); Job 1048 (N); C. Meyer s.n. [T. Meyer 3001] (N); Ruiz Huidobro 3080 (Gg--353254, N), 3182 (N, Ok, Rf), 3216 (N), 3381 (N, N), 3418 (N); Terribile 403 (N), 455 (N). Santiago del Estero: Cuezzo 2382 (N); Lillo 6185 [Herb. Inst. Miguel Lillo 31423] (N); Luna Risso 8 (N), 23 (N). Tucumán: Baer 39 (S); R. E. Fries s.n. [near Tucumán, 16.10.48] (S); Lillo 10692 [Herb. Inst. Miguel Lillo 31413; Herb. Osten 8463] (Du--317607, N, Ug, Ug--4940); Lorentz & Hieronymus s.n. [5--22.XII.72] (N); T. Meyer 3421 [Herb. Inst. Miguel Lillo 35404] (En, N); Moldenke & Moldenke 19722 (Es, Lg, N, Sm); Monetti 91 [Herb. Osten 10878] (Ug), 96 [Herb. Inst. Miguel Lillo 31421] (N); Peirano s.n. [Mariño, Oct. 15, 1932; Herb. Inst. Miguel Lillo 32897 (N);

Schreiter 73 [Herb. Inst. Miguel Lillo 32767] (N), *s.n.* [San Pedro de Colalao, Dec. 1917; Herb. Osten 12187] (Ug), *s.n.* [Tucumán, Oct. 17, 1917; Herb. Osten 12188] (Ug); *C. Skottsberg s.n.* [Estacion Agricola Experimental, 16/10/48] (Go); *Terribile 144* (N), *287* (N); *Venturi 78* (W--1591211), *462* [Herb. Inst. Miguel Lillo 31428] (N, W--1591220), *2300* (Ca--342547, S, W--1343273); *Wall & Sparre s.n.* [12/11/46] (Ew), *s.n.* [24/11/46] (Ew). Province undetermined: *Jameson 125/26* (W--1544546); *Tamson s.n.* (V--8997). LOCALITY OF COLLECTION UNDETERMINED: *Née 114* (Q).

VERBENA GRACILIS Desf., Cat. Pl. Hort. Reg. Par., ed. 3, 393. 1829 [not *V. gracilis* Cham., 1832].

Synonymy: *Verbena remota* Benth., Pl. Hartw. 21. 1839. *Verbena parviflora* Ruíz ex Walp., Repert. Bot. Syst. 4: 25, in syn. 1845 [not *V. parviflora* Larrañ., 1923]. *Verbena arizonica* A. Gray, Proc. Am. Acad. Sci. 19: 95. 1883 [not *V. arizonica* Briq., 1907]. *Verbena parviflora* Pavon ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963.

Bibliography: Desf., Cat. Pl. Hort. Reg. Par., ed. 3, 393. 1829; Benth., Pl. Hartw. 21. 1839; Walp., Repert. Bot. Syst. 4: 24--25. 1845; Schau. in A. DC., Prodr. 11: 549. 1847; S. Wats., Proc. Am. Acad. Sci. 18: 136. 1883; A. Gray, Proc. Am. Acad. Sci. 19: 95. 1883; Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; M. Armstrong, Field Book West. Wild Fls. 435. 1915; Stapf, Ind. Lond. 6: 429. 1931; Perry, Ann. Mo. Bot. Gard. 20: 245, 248, 261, 297, 300--301, & 355. 1933; Moldenke, Prelim. Alph. List Invalid Names 44, 48, & 56. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 14, 18, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 45, 47, & 50. 1942; Herter, Revist. Sudam. Bot. 7: 225. 1943; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke, Alph. List Cit. 1: 28, 46, 53, 203, 216, 242, 246, 254, & 261. 1946; Moldenke, Phytologia 2: 331. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 2: 393, 403, 467, 480, 497, 498, 519, 527, 540, & 626 (1948), 3: 656, 685, 698, 708, 730, 740, 752, 765, 767, 785, 787, 799, 828, 830, 831, 891, 933, & 963 (1949), and 4: 996, 1076, 1128, 1171, 1174, 1175, 1180, 1224, 1229, 1233, 1245, 1247, & 1291. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 19, 26, 33, 164, & 198. 1949; Moldenke, Phytologia 3: 73. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; J. Rzedowski, Anal. Esc. Nac. Cienc. Biol. 8: 105. 1954; Moldenke, Inform. Mold. Set 49 Spec. 3. 1954; Moldenke, Résumé 24, 32, 39, 223, 358, 365, 373, & 471. 1959; Moldenke, Résumé Suppl. 2: 11, 12, & 22. 1960; F. Miranda, Bol. Soc. Bot. Mex. 26: 181, 182, 184, & 219. 1961; Moldenke, Résumé Suppl. 3: 10 (1962) and 6: 11. 1963.

Illustrations: M. Armstrong, Field Book West. Wild Fls. 435. 1915.

Low diffusely branched annual or perennial herb, varying from upright to decumbent or semi-prostrate; stems 20--40 cm. long or tall, widely branching, round-angled, whitish-hirsute, more or less glandular; branches decumbent to ascending, more or less glandular, canescent, hirsute; leaves decussate-opposite, abundant along the stems, ovate or obovate, 1--8 cm. long, cuneate at the base and narrowed into a margined petiole, incised-pinnatifid to pinnately cleft or bipinnatifid, the segments oblong or lanceolate, rather acute, hirsute especially beneath, sometimes glandular, subincised, the midrib and venation impressed above; spikes terminal, sessile, slender, more or less sparsely flowered, to about 15 cm. long, the lowermost flowers often appearing in the upper leaf-axils; bractlets linear, attenuate, gradually decreasing in length toward the tip of the spike, usually much longer than the calyx; flowers small; calyx 2--3 mm. long, more or less glandular-hirtellous, the rim subtruncate, the teeth minute and subulate; corolla inconspicuous, varying from blue or light-blue to lavender-blue, lilac, pale-mauve, pink, or purple, its tube somewhat longer than the calyx, the limb 2--3 mm. wide; cocci 1.5—2 mm. long, finely scrobiculate from the apex practically to the base, the commissural face muricately scabrous.

This species was described by Desfontaines from a specimen cultivated in 1829 in the Jardin des Plantes at Paris and probably deposited in the herbarium of the Muséum National d'Histoire Naturelle in that city. The type of V. remota is Hartweg 174 from Aguas Calientes [or Zacatecas, according to the Kew specimen], Mexico. Schauer (1847) reduces both V. remota and V. gracilis to synonymy under V. canescens H.B.K. Hooker & Jackson (1895) reduce V. arizonica A. Gray to V. remota, and then reduce the latter and V. gracilis to V. canescens. In my Prelim. Alph. List Invalid Names 56 (1940), Alph. List Invalid Names 47 (1942), and Résumé 365 (1959) I also erroneously reduced V. gracilis to synonymy under V. canescens.

It should be noted here that V. gracilis of Chamisso is a synonym of V. intermedia Gill. & Hook., the V. arizonica of Briquet is a synonym of V. gooddingii var. nepetifolia Tidestr., and the V. parviflora of Larrañaga belongs in the synonymy of V. litoralis H.B.K.

Verbena gracilis is placed by Walpers (1845) in his Sect. Verbenaca, Subsect. Inermes, Group Foliosae, Subgroup Micranthae, Secondary Subgroup Schizophyllae, along with 9 other species. The species inhabits sandy or dry red gravelly soil, sandy loam, and rich moist soil of open woodlands and fields, and has been collected in waste places and grasslands, swales and dry steep-walled canyons, on gravelly brush-covered plains, mesas and bare hills, roadside bankings and moist depressions, roadsides in high level ground, pedrigal lava-beds and grassy plains, dry calcareous mesas and volcanic flats, among pines in mountains, on flat mountaintops with acacias, and the sides of steep dry ravines, at altitudes of 1300 to 2832 meters, blooming and fruiting from March to September. Mueller says that it is rare in meadows in Nuevo León, while Benson reports it from swales in desert grasslands in the Lower Sonoran life-zone. It was apparently introduced into cultivation in or about 1829.

Herbarium material of this species has been misidentified and distributed under the names *V. bracteata* Lag. & Rodr., *V. bracteosa* Michx., *V. bracteosa* var. *brevibracteata* Gray, *V. canescens* Kunth, *V. hastata* L., *V. menthifolia* Benth., *V. multifida* Pav., *V. neomexicana* Small, *V. plicata* Greene, and even *Myosotis* sp. in the *Boraginaceae*. On the other hand, the *Waterfall & Wallis 13806* distributed as *V. gracilis* is partly *V. canescens* H.B.K. and partly *V. ciliata* Benth.; *Conzatti 4288* is *V. canescens*; *J. R. West 13216* is *V. ciliata*; *Parry & Palmer 720* is *V. elegans* var. *asperata* Perry; while *Goodding 334*, *Herb. Le Roy s.n.* [Ariz., '84], *M. E. Jones s.n.* [Colonia Juarez], *C. B. Maguire 10884*, and *Pringle s.n.* [Santa Rita Mts., May 11, 1884] are all *V. neomexicana* var. *xylopoda* Perry. The *MacDougal 634* previously regarded as *V. gracilis* proves actually to be *V. neomexicana* var. *hirtella* Perry. The *J. J. Thornber s.n.* [Rosemont, Sept. 2, 1905], cited below from Santa Cruz County, may actually have been collected in Pima County, Arizona.

Waterfall found this species on dry grassy and grassy stony flats, while with Wallis he found it on silty flats, cliff sides and top, and in grasslands with stony outcrops or with scattered pines. Gregory & Eiten encountered it "in wet alluvial sand among boulders next to river in barranca". McVaugh reports it from "periodically flooded flats and sandy washes entering the flats", while Maysilles found it on "gentle west-facing slopes of broad arroyo, open grasslands in pine-oak woodland" and describes it as a "roadside weed in open meadows in pine forests."

Perry (1933) cites the following 36 additional specimens not as yet seen by me: ARIZONA: Cochise Co.: *Blumer 1612* (E, F, G); *Lemmon s.n.* [Tanner's Cañon, near Fort Huachuca, 1882] (G). Pima Co.: *Pringle s.n.* [Gardiner's Spring, June 25, 1882] (D, F, G). MEXICO: Aguas Calientes: *Hartweg 174* (G, K). Chihuahua: *Pringle 54* (G), *s.n.* [near Chihuahua, 7 May 1887] (E, F). Durango: *Nelson 4593* (E); *Edw. Palmer 135* (E, F, G), *456* (G). Federal District: *Pringle 6539* (D, E, F, G), *9135* (E, G). Hidalgo: *Pringle 7590* (E, F), *13159* (F, G). México: *Berlandier 578* (E); *Bourgeau 361* (G); *Rose, Painter, & Rose 3495* (G). Oaxaca: *Seler 22* (G). San Luis Potosí: *Parry & Palmer 722* (E, G); *Schaffner 720* (D, E, G). She says "*V. gracilis* is probably a relative of *V. canescens* and *V. neomexicana*. It is easily recognized by its slender habit, usually long-attenuate bracts, tiny flowers, and essentially scrobiculate nutlets. The specimen from Utah is atypical, but for practical purposes seems better referred here."

In all, 153 herbarium specimens have been examined by me.

Citations: UTAH: San Juan Co.: *Rydberg & Garrett 9201* (N).

ARIZONA: Cochise Co.: Blumer 24 (Tu), 1612 [N.24] (Du--9546, Ka--60316, N, Tu, W--561809, W--563384); Goodding 292 (Tu); Mearns 1116 (W--229064); Pataky s.n. [Fort Huachuca, 1890] (W--771871); W. W. Price s.n. [Aug. 24, 1893] (Du--96341); Pringle s.n. [Camp Lowell, June 8, 1882] (Du--91156); Shreve 7734 (Fs, Mi); Waterfall 12914 (St); T. E. Wilcox 29 (W--213239), s.n. [Ft. Huachuca, July 1892] (C), s.n. [Near Fort Huachuca, 1894] (W--213031). Pima Co.: Pringle s.n. [Gardiner's Spring, June 25, 1882] (C, Ll, Pa, Sg--68313, Up--17096, Vt, W); J. J. Thornber 5637 (Tu). Santa Cruz Co.: L. Benson 10426 (Po--267651, Tu--14082); J. J. Thornber s.n. [Rosemont, Sept. 2, 1905] (Tu). MEXICO: Aguas Calientes: Hartweg 174 (N). Chihuahua: Correll & Johnston 21530 (Ld); Le Sueur 872 (Au); Mexia 2568 (Ca--442625, Gg--286757, Mi); Edw. Palmer 200 (W--573677); Pringle 54 (Vt), s.n. [24 Julio 1885] (Me), s.n. [7 May 1887] (Ca--104858), s.n. [22 Mayo 1887] (Me); Shreve 8008 (Fs), 8044 (Fs, W--1749160); S. S. White 2468 (Mi). Coahuila: Stanford, Retherford, & Northcraft 126 (Ca--713894, Du--291287, N, Se--70452). Durango: J. H. Maysilles 7497 (Mi, N), 8097 (Mi); E. W. Nelson 4593 (W--332609); Edw. Palmer 135 (Ca--104859, Me, Me, N, W--304237), 456 (W--571481), 911 (W--304612); Waterfall 15402 (St), 16163 (Ca), 16178 (Ca); Waterfall & Wallis 13402 (St), 13417 (St), 13483 (St), 13528 (St), 13622 (Ok). Federal District: Balls 4952 (W--1793739), B.4952 (Ca--684616); Bourgeau 361 (Br), 547 (Br, S); G. L. Fisher 35208 (Ew, Mi, N, W--1686256), s.n. [Villa de Obregon, July 18, 1935] (Fs); E. Lyonnet 1233 (W--1746020), 1562 (W--1746717); Miranda, Barkley, & Rowell 7462 (Au); Pringle 6539 (Br, Ca--104857, Cm, Gg--152313, Io--38759, Me, Me, Me, Me, Mi, Mm--15393, N, S, Vt, W--287765), 9135 (N); Rose & Hay 5488 (W--395248); Rose, Painter, & Rose 8495 (W--451987); A. J. Sharp 44228 (N). Guanajuato: Née 28 (Q). Guerrero: Hinton 5847 (N, W--1344912). Hidalgo: Moore & Wood 4131 (Ba); Pringle 7590 (B, Po--63968), 13159 (Gg--421272, Mi, Tu--35528, Vt, W--461756), s.n. [El Salto, 15 Sept. 1902] (Vt); F. Salazar s.n. [Huauchinango] (Me), s.n. [Nopala, Aug. 1, 1913] (W--1013229). Jalisco: Gregory & Eiten 158 (Mi); McVaugh 16880 (Mi). México: Berlandier 578 [274] (Du--166499, W--1169371); Bourgeau 361 (Cb); Matuda 26165 (Cb), 26302 (Z); J. V. Santos 2204 (Mi); Schiefer 39 (Vi). Nuevo León: M. T. Edwards 49 (Du--277046); Frye & Frye 2392 (W--1790998); C. H. Mueller 2392 (Mi). Querétaro: Kuntze 28444 (N, N); Waterfall & Wallis 13996 (St). San Luis Potosí: Barkley, Rowell, & Paxson 826 (Au--123256, N); Barkley, Webster, & Paxson 768 (Au--123279, N), 810 (Au--123255, N); C. L. Lundell 5047 (La); Parry & Palmer 722 (Io, Pa, W--56135). Sonora: Gregg s.n. [San Lorenzo, 11/47] (T); S. S.

White 947 (Mi). Vera Cruz: A. J. Sharp 45487 (N). Zacatecas: Shreve 7199 (Ca--731765, Fs); Weintraub & Roller 20 (Mi). State undetermined: Halsted s.n. [La Olla] (T); Née 104 (Q); Schmitz 478 (Bm); W. Schumann 1070 [Faral] (W--1323054). CULTIVATED: France: M. Martens s.n. [h. b. Par. 1835] (Br, Br), s.n. [hort. insul. 1836] (Br). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jan. Gen. 22 Spec. 3 (S).

VERBENA GRISEA Robinson & Greenm., Am. Journ. Sci. 150 [ser. 3, 50]: 142--143. 1895.

Bibliography: Robinson & Greenm., Am. Journ. Sci. 150 [ser. 3, 50]: 142--143. 1895; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 101. 1942; Moldenke, Castanea 13: 116. 1948; Moldenke, Alph. List Cit. 3: 972. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 198. 1949; Moldenke, Résumé 81 & 471. 1959.

Densely and somewhat sericeously grayish-tomentose, in parts brownish or ferruginous in the dried state; stems tetragonal, somewhat furrowed; internodes mostly considerably exceeding the subtending leaves; leaves decussate-opposite, petiolate; leaf-blades ovate or deltoid in outline, 2.5 cm. or more long, so densely pubescent as to obscure completely the venation on both surfaces, bipinnatifid, the rachis and segments very narrow, not 2 mm. wide, frequently curled, obtusish at the apex; inflorescence branched, the flowers small, borne in slender loose elongating spikes, the central spike floriferous almost from the base, the others more or less pedunculate; bractlets small, subulate, 1/3 to 2/3 the length of the calyx, pubescent; calyx cylindric, about 2 mm. long, 5-ribbed, hirsute-pubescent on the outer surface, the rim very shallowly and obtusely 5-toothed; corolla nearly twice as long as the calyx, pubescent in the throat, the limb unequally 5-lobed, the lobes rounded at the apex; anthers unappendaged.

The type of this very distinctive species was collected on Duncan Island, Galapagos Islands, in August, 1891. The authors say that it is a member of the Leptostachya "with much the habit of V. remota Benth., but differing in pubescence and foliage." The species is said to be rare around 1250 feet elevation on Duncan Island. It has been collected in anthesis in August and in fruit in August and December. In all, 3 herbarium specimens and 4 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Duncan: A. Stewart 3315 (Gg--31276, N), 3316 (F--photo, Gg--31277, N--photo, Si--photo, Z--photo),

VERBENA GYMNOBASIS Wedd., Chlor. And. 2: 156. 1860.

Synonymy: Verbena bella R. A. Phil., Anal. Mus. Nac. Chil. 1891: 58. 1891.

Bibliography: Wedd., Chlor. And. 2: 156. 1860; R. A. Phil., Anal. Mus. Nac. Chil. 1891: 58. 1891; Hook. f. & Jacks., Ind. Kew.

2: 1179. 1895; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Reiche, Fl. Chile 5: 285 & 286. 1910; Moldenke, Suppl. List Invalid Names 7. 1941; Herrera, Sinop. Fl. Cuzco 1: 352. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101. 1942; Moldenke, Alph. List Invalid Names 45. 1942; Moldenke, Lilloa 8: 430 (1942) and 10: 384. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 198. 1949; Moldenke, Alph. List Cit. 3: 687 & 813. 1949; Moldenke, Phytologia 3: 454. 1951; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 54. 1951; Moldenke, Résumé 115, 121, 358, & 471. 1959; Ricardi, Gayana 3: 13. 1961; Moldenke, Résumé Suppl. 3: 14. 1962.

Herbaceous perennial or slightly suffruticose, canescent-hirtous throughout, 10--20 cm. tall; stems several from a single root, somewhat woody at the base, decumbent and spreading over the ground, about 15 cm. long; branches ascending; branchlets short, in the leaf-axils, foliose, resulting in an appearance of pseudo-verticillate linear leaves; leaves numerous, sessile, 1--1.5 cm. long, 3-parted so deeply to the base as to give the appearance of a whorl of 6 linear simple leaves at each node, the segments linear or narrow-linear, obtuse or rather acute at the apex, entire or rarely bifurcate, revolute along the margins; spikes terminal, short-pedunculate, many-flowered, the floriferous portion short, ovate after anthesis, in fruit not over 1.5 cm. long; bractlets linear, half as long as or slightly shorter than the calyx, 2--4 mm. long; calyx linear or prismatic, 4--8 mm. long, the rim 5-fid, the teeth bristle- or awl-shaped; corolla dark-red, its tube subinfundibular, about half again or twice the length of the calyx, the limb rose-purple or deep-red, vivid, ampliate, about 1 cm. wide, the lobes rounded, subemarginate at the apex; stamens included in the corolla-tube; anther-connectives unappendaged; one of the style-branches hornlike and smooth, the other obtuse and papillose; ovary deeply 4-lobed or -lobulate to the middle; cocci about 2.5 mm. long, wrinkled or obsoletely scrobiculate on the dorsal surface.

The type of this species was collected by Hugh Algernon Weddell along the road from Tacna to La Paz, at 4000 feet altitude, in the Cordillera de Tacora, Peru. The type of V. bella was collected by Rudolf Amandus Philippi at Sibaya in the Cordilleras de Tacna, Tarapacá, Chile.

Herrera (1941) cites a "Gay 1839" from "Cuzco: Andes del Departmento" in Peru, which is probably the type collection of var. strigosa Wedd. (see below). The species has been gathered at 2400 meters altitude in Bolivia, flowering in April. The original publication is sometimes cited as "1855", "1857", or "1857--61", but seems actually to have been issued in 1860. The calyx is described as 4--5 mm. long in V. gynobasis and 8 mm. long in V. bella. Acevedo de Vargas (1951) cites the 3 following specimens and photographs: CHILE: Tarapacá: C. Rahmer s.n. [15. III.1885] (Sg--54671), s.n. [III.1885] (Sg--42458); R. A. Philippi s.n. [Sibaya; Macbride photos 17419] (Sg--photo).

In all, 3 herbarium specimens and 2 mounted photographs have been examined by me.

Citations: BOLIVIA: Santa Cruz: *Troll 3312* (B). Province undetermined: *Lobb s.n.* [Bolivia; Herb. Reichenbach f. 158619] (N, V). CHILE: Tarapacá: *R. A. Philippi s.n.* [Sibaya; Macbride photos 17419] (Kr—photo, N—photo).

VERBENA GYNOBASIS var. STRIGOSA Wedd., Chlor. And. 2: 156 [as "β *strigosa*"]. 1860.

Bibliography: Wedd., Chlor. And. 2: 156. 1860; Moldenke, Résumé Suppl. 3: 13 & 38. 1962.

This variety differs from the typical form of the species in having the hair on the stems, branches, and leaves more strigose, rather than hirtous, and the corollas smaller.

The type of the variety was presumably collected by Claude Gay in the Andes of Cuzco, Peru, in 1839, if we can assume that the second specimen mentioned by Weddell in his discussion of *V. gynobasis* represents this variety which he designated as "β" and that the first represents the typical form of the species. It is known to me only from the original description.

VERBENA HALEI Small, Bull. Torrey Bot. Club 25: 617. 1898.

Synonymy: *Verbena leucanthemifolia* Greene, Pittonia 5: 135. 1903. *Verbena hallei* Small ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. *Verbena hallii* Small ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. *Verbena halei* L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. *Verbena coerulea* Vatke ex Moldenke, Résumé 362, in syn. 1959 [not *V. coerulea* Hort., 1959]. *Verbena haleii* Small ex Moldenke, Résumé 365, in syn. 1959. *Verbena haleyi* Small ex Moldenke, Résumé 365, in syn. 1959. *Verbena helei* Small ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. *Verbena officinalis* x *xutha* Engelm. ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. *Verbina halei* Small ex Moldenke, Résumé Suppl. 3: 42, in syn. 1962.

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Illustrations: Dermen, Cytologia 7: 163, fig. 11. 1936; Lewis & Oliver, Am. Journ. Bot. 48: 640. 1961.

Slender, nearly smooth, annual or perennial herb, 20--120 cm. tall, erect, not spreading (or rarely nearly prostrate), branched at the base or (usually) branched only near the top; roots fibrous; stems usually several from a woody base, erect, to 55 cm. tall, ascendingly branched, glabrous or strigillose above, leafy below; bark green; branches erect, about 45 cm. long; leaves decussate-opposite, 3--10 cm. long, strigillose on both surfaces, diverse in outline -- the basal and lower stem-leaves oblong to ovate, tapering into a petiole approximately as long as the leaf-blade, variously and irregularly dentate or incised to lobed or dissected, the middle stem-leaves 1- or 2-pinnatifid, with shorter petioles, and the uppermost sparingly dentate or entire; spikes slender, open, elongate, 2--5 per branch, paniculately disposed; bractlets about half as long as the calyx, appressed, ciliate-margined; flowers small, odorless; corolla varying from blue, bluish, light-blue, pale-blue, bluish-lavender, or purple-blue to purplish, deep blue-purple, lavender-purple, purple, lavender, pale-lavender, light-lavender, gray-lavender, or pinkish-lavender, its tube scarcely longer than the calyx, the limb 6--7 mm. wide, the lobes retuse at the apex; fruiting-calyxes remote, 3--3.5 mm. long, strigillose, subtruncate, the broad veins terminating in unequal subulate teeth; fruit not much longer to twice as long as broad; cocci trigonous, approximately 2.5 mm. long, usually prominently striate, raised-reticulate at the apex, the commissural faces muricate; chromosome number: n = 7, 2n = 14.

The type of this species was collected by Josiah Hale somewhere in Louisiana and is deposited in the Torrey Herbarium at the New York Botanical Garden, although the original description cites, in addition, *Croft 119*, *Heller 1419*, and *Palmer 242*, with no specific type designated. The species is named in honor of the original collector.

This very common species from the southern United States and adjacent Mexico passed for many years as *V. officinalis* L., an Old World species introduced sparingly in the eastern and southeastern United States, but not known from Texas where *V. halei* is extremely abundant and widespread. The Texan record for *V. officinalis* given by Britton & Brown (1903 & 1913) refers to *V. halei*. The type of *V. leucanthemifolia* was collected by Samuel Mills Tracy (*no. 7996*) at Abilene, Taylor County, Texas.

Verbena halei has been collected in clay, red sandy clay, sandy, light sandy, tight sandy, dry sandy, and yellow clay soils, sandy-gravelly, heavy alkaline, limestone, and rocky limestone soils, on rough stony hillsides and calcareous prairies, in sandy oak and post oak woods and rich meadows, dry and open ground, dry rocky or gravelly open ground, waste ground and sandy or sandy clay loam, on prairies and sandy prairies, dry banks and low sand ridges, sandy bottoms, heavy alkaline soil of mesquite forests, mud flats, grassy road shoulders, along roadsides and sandy roadsides, near gravel pits, in dry exposed soil along railroad tracks, in open ground and fields, sandy or moist bottomland pastures, sandy fallow fields, sandy woodlands, pine-hardwood forests, ditches and roadside ditches, dry pasture lands, gravelly sandbars, house-ruins, mesquite forests, clay hardpan, sandy meadows, and open waste ground, on sand or red sand, sandy hillsides, granite outcrops, dry prairies, levees, and dry ridges, at the borders of sandy woods, at the edge of grassy slopes in mixed pine-oak woodland associations, between sugarcane fields, at the edge of city streets, in open cedar woods on granite and in woods on sand, along little valleys in rocky calcareous soil on hillsides, in sandy clay, open grasslands, black or black bottom soil, red sandy soil, deep sand, and low places in prairies, moist swales in sandy prairies, on gravelly and on rocky open ground, in wet soggy places, in brush along small arroyos, grassy openings in post oak woods, on mesquire prairies and sandy uplands, in the shade of trees in old riverbeds, in openings in oak-hickory woods, along fencerows, on sandstone bluffs and sandy ridges, on ungrazed cleared sandhill areas in oak forests, oak-pine woods on gentle slopes, in the rocky beds of small streams and dry charco beds, in dry valley land and open prairies, on rocky riverbanks, and in sand and shell soil, at altitudes of 3 to 135 meters, flowering in every month of the year. It has been collected in fruit from March to January.

Collectors record the species from swales and moist swales, among brush on hard-packed caliche sand flats, in sandy soil at the edge of live oak motte near the coast, in deep white sand on flat slopes, vacant lots, open roadsides, waste places in fields, as a weed in disturbed soil of grass nurseries, loose sand, pasture areas at the edge of beaches, clearings near ponds, along ditches in deserts, blackland prairies on Upper Cretaceous marls on top of Marquez salt domes, close to water's edge at lakes, clay dunes, sandy prairie flats between live oak mottes, roadside clearings in brush, well-packed sandy prairies, shell hash ridges, in and around abandoned truck gardens, and in gumbo glades (a local prairie on tight marly clay completely surrounded by pinewoods on sand).

Godfrey says that the species is "abundant on grassy roadside shoulders" in Jackson County, Florida, while Murrill (1945) reports it common in waste ground in the Gainesville area of Florida, but otherwise "rare" in the state. Chambers says that it is "not common" in open woods in Travis County, Texas. Ball reports it common on dry banks in Louisiana, while the Corrells found it in open dry gravelly soil along railroad embankments in that state. In Oklahoma it is said by Waterfall to inhabit sandy soil at the edge of water oak - green ash associations along rivers. In Texas Ferguson found it growing on the sides of sandy clay bluffs along rivers in Travis County, while Warnock says that it is "infrequent in limestone soil" in the same county and "infrequwnt around old dirt tank" in Brewster County; Cory avers that it is infrequent on highway shoulders in Culberson County; Hoisington found it along roadsides in sandy soil on a limestone base in Erath County; E. D. Schulz says that it is "very common in southern Bexar and all of Atascosa County"; and Cory reports it as frequent in sandy soil of roadsides in Kleberg County and frequent in grasslands in San Patricio County. In Reeves County it was collected in calcareous soil along depressions and ditches through the Larrea-Prosopis association by Waterfall, and in Burnet County in red granitic soil on overgrazed savannas by Rose-Innes & Warnock. Dooley found it among mixed vegetation in sandy loam in Waller County, and Gray in "open sandy loam, full sun, with mixed grasses and weeds" in Brazos County. Warnock reports it infrequent in sandy silt in Brewster County, and Warner as "common in sandy loam, occurs in all soils" in Montgomery County. Runyon describes it as frequent in Kenedy and abundant in Hidalgo County, while in Cameron County he reports it as "frequent to abundant in open ground" and "frequent throughout this region, blooming throughout the summer months". Warnock says that it is "frequent along highways in Jackson group soil formation" in Bastrop County

In Sinaloa it was collected by Gentry in heavy clay soil of the coastal plain thorn forest. Tolstead & Cory (1946) refer to it as "an inconspicuously flowered weedy plant." Johnson describes it as frequent locally (in Runnels County) in moderately moist silty clay loam associated with *Cirsium austrinum*, *Phalaris*, and *Amblyolepis setigera*. Williges calls it frequent in sandy clay in San Patricio County, and Rowell says that it is "frequent in oak-hickory woodland surrounding bog" in Robertson County. Cory refers to it as "infrequent in sandy soil on lake front" in Marshall County. Ewan encountered it in vacant lots with *Lepidium virginianum* in partial shade of billboards. Johnston found it "in sparse mesquite brush on prairies" and on "brushy bluestem prairies in brownish-gray sand-clay loam along railroad rights-of-way."

The *Lindheimer s.n.* [dry prairies on the Brazos, Aug. 1843], cited below, has its spikes fasciculate-deformed; *LeSueur 399* is a very pubescent form. M. S. Young says "perennial, described as annual by Lindheimer." It is also described as annual by various other collectors. Stephenson describes the flowers as "purple to white". *Arsène 10242* bears some resemblance in form of the upper leaves and density of the spikes to *V. litoralis* H.B.K., but the pubescence on the bractlets and calyx is that of *V. halei*.

In regard to *Lindheimer 77* [I.155], in part, cited by me as from Palo Pinto County, Texas, Dr. Geiser thinks that Lindheimer never collected in that county and that the collection must have been made in some other county -- the label merely states "Dry prairies on the Brazos, July and August, 1843". Similarly, *E. D. Schulz 2502*, cited below from DeWitt County, has a label reading "Cuero to Gonzales" and so may actually have come from another county. The *M. E. Jones 28294*, cited below from Kerr County, Texas, is actually inscribed "Kerr to Bexar Co." The *Edw. Palmer 242* cited below from Johnston County, Oklahoma, may have come from Atoka County according to McVaugh, Edw. Palmer Plant Explorer of the American West (1956). It is apparently Palmer's original *no. 339* and is inscribed "on the False Washita between Ft. Cobb and Ft. Arbuckle" on the label.

E. D. Schulz points out on her *no. 2812* that the fruit there is not much longer than broad, while on her *s.n.* [Austin, 6-30-1920] and *s.n.* [Palestine, 1930] it is twice as long as broad, and on her *s.n.* [Galveston Island, 9/30/1938] it is about as long as wide. *Lundell* & *Lundell* *10344* is said to have the flowers "pink or lavender", but they dry to the same coloration as those on all the other specimens of their collections of this species. On the *Collector undesignated s.n.* [Col. Ter. 1873] specimen cited below, originally determined as *V. stricta* Vent., someone has added "This is a libel on *Verbena stricta*. It is probably a variety of *V. officinalis*. Dr. Engelmann has one marked *V. officinalis* x *xutha*."

Common names reported for *V. halei* are "blue vervain", "candelabra verbena", "European vervain", "Hale's verbena", "herb-of-the-cross", "slender vervain", "standing verbena", "tall vervain", "vervain", and "wild verbena". Herbarium specimens have been misidentified and distributed under the names *V. angustifolia* Michx., *V. bipinnatifida* Nutt., *V. canescens* Kunth, *V. canescens* var. *roemeriana* (Scheele) Perry, *V. carolinensis* (Walt.) Gmel., *V. caroliniana* L., *V. engelmannii* Moldenke, *V. hastata* L., *V. littoralis* H.B.K., *V. littoralis* var. *leptostachya* Schau., *V. menthaefolia* Benth., *V. neomexicana* Small, *V. neomexicana* (A. Gray) Small, "*V. neomexicana* var.?", *V. officinale* L., *V. officinalis* L., *V. officinallis* L., *V. officionalis* L., *V. plicata* Greene, *V. polystachya* H.B.K., *V. simplex* Lehm., *V. spuria* L., "*V. spuria* var.", *V. stricta* Vent., *V. stricta* f. *stricta* [Wallis], *V. urticaefolia* L., *V. urticifolia* L., *V. xutha* Lehm., *Verbina xutha* Lehm., *Bouchea linifolia* A. Gray, *Nama hispida* Torr., and *Phyla* sp.

On the other hand, the *H. S. Gentry 598m*, distributed as *V. halei*, is *V. carolina* L.; *R. M. King 4432* is *V. litoralis* H.B.K.; *H. S. Gentry 1341* and *K. F. Parker 8204* are *V. menthaefolia* Benth.; *S. S. White 1577* is *V. neomexicana* (A. Gray) Small; *Garner 50*, *H. J. Hamby 792*, *E. G. Marsh 684*, and *Parks & Cory 16905* are *V. neomexicana* or its var. *hirtella* Perry; *B. H. Warnock 8020* is *V. scabra* Vahl; *Wolff 829* is *V. xutha* Lehm.; and *R. M. King 4294* is *Achyranthes aspera* L. in the *Amaranthaceae*, while the *E. W. Nelson 6096*, annotated by Perry as "Aff. *V. Halei* or *V. xutha*" is *V. pinetorum* Moldenke.

Wagner & Barkley 16T322 is a mixture with *V. plicata* Greene. The *G. Jermy 87* and *M. S. Young s.n.* [4/5/18], cited below, are a mixture with *V. canescens* var. *roemeriana*; *M. E. Jones s.n.* [west of Uvalde, April 26, 1931] is a mixture with *V. menthaefolia*; *C. C. Albers 33017*, *R. Runyon 1777*, and *L. F. Ward s.n.* [Hearne, Sept. 11, 1877] are mixtures with *V. xutha*; and *Tharp s.n.* is a mixture with *Apium leptophyllum* F. Muell. The *M. Shepard s.n.* [June 1934] specimen in the University of Texas herbarium has the collector's surname misspelled "Sheperd". Dr. Lundell thinks that *Lundell & Lundell 10076* represents a new species.

The hybrid of *V. halei* with *V. lasiostachys* Link is x*V. scorta* Moldenke, with *V. neomexicana* (A. Gray) Small is x*V. notha* Moldenke, with *V. officinalis* L. is x*V. conata* Moldenke, and with *V. stricta* Vent. is x*V. goodmani* Moldenke.

Perry (1933) cites the following 81 additional specimens not as yet seen by me: ALABAMA: County undetermined: *Buckley s.n.* (E); *Deweys s.n.* [Frascati, 11 May 1904] (G). MISSISSIPPI: Adams Co.: *Shimek s.n.* [Natchez, June 1898] (E). Jackson Co.: *Seymour 50* (G); *Skehan 46* (G), *109* (E, G). County undetermined: *Hilgard s.n.* [cultivated grounds near coast, May 1859] (E). LOUISIANA: Cameron Par.: *S. M. Tracy 8709* (E, F, G). Jefferson Par.: *Ball 344* (E, G). Natchitoches Par.: *E. J. Palmer 7369* (E). Rapides Par.: *J. Gregg s.n.* [Alexandria, 29 Aug. 1847] (E). Saint Tammany Par.: *Joor s.n.* [Madisonville, 14 May 1888] (E). Parish undetermined: *Hale 245* (N), *s.n.* (G). OKLAHOMA: Murray Co.: *Stratton 62* (E). TEXAS: Bexar Co.: *Berlandier 322* (G), *1592* (G); *Groth 75* (G); *Wilkinson s. n.* [San Antonio, 1900] (E). Bowie Co.: *Letterman s.n.* [Texarkana] (E). Brazoria Co.: *B. F. Bush 77* (E, G), *84* (E, G); *E. J. Palmer 5044* (E). Brazos Co.: *E. J. Palmer 11715* (E). Cameron Co.: *Chandler s.n.* [Rio Hondo, Sept. 1913] (E, G). Cass Co.: *Eggert s.n.* [near Polk, 13 June 1898] (E). Comal Co.: *Lindheimer 1076* [537] (E, G). Comanche Co.: *Eggert s.n.* [near Comanche, 8 May 1900] (E). Dallas Co.: *Eggert s.n.* [North Dallas, 27 June 1899] (E); *Reverchon 42* (G), *732* (E). Gillespie Co.: *Jermy 203* (E). Goliad Co.: *Eggert s.n.* [near Goliad, 8 April 1900] (E). Gregg Co.: *Eggert s.n.* [near Longview, 19 April 1899] (E). Harris Co.: *B. F. Bush 28* (E); *Eggert s.n.* [Houston, 21 April 1899] (E); *E. Hall 432* (E); *Lindheimer 155* [106] (E). Hood Co.: *Eggert s.n.* [near Granbury, 4 May 1900] (E). Hudspeth Co.: *M. E. Jones 26229*, in part (E). Kerr Co.: *E. J. Palmer 10037* (E). Kleberg Co.: *High 52* (E). LaSalle Co.: *Trelease s.n.* [Millett, 11 May 1897] (E). Mc Lennan Co.: *Pace 22* (E). Nueces Co.: *A. A. Heller 1419* (E, G); *Orcutt 5867* (E). Refugio Co.: *E. J. Palmer 9111* (E). San Augustine Co.: *E. J. Palmer 9435* (E). Tarrant Co.: *Ruth 108* (E, G). Taylor Co.: *S. M. Tracy 7996* (E, F, G). Travis Co.: *M. S. Young 77* (E). Uvalde Co.: *E. J. Palmer 13564* (E), *33604* (E). Webb Co.: *Eggert s. n.* [near Laredo, 6 April 1901] (E); *K. K. Mackenzie 96* (E). Wichita Co.: *Ferris & Duncan 3337* (E). Wilson Co.: *E. J. Palmer 1043* (G). County undetermined: *Lindheimer s.n.* [Mill Creek, April 1839] (E). Galveston Island: *Lindheimer s.n.* [Galveston Island, May 1843] (E); *S. M. Tracy 7533* (E, F, G). MEXICO: Tamaulipas: *Berlandier 1511* (E, G), *3016* (E, G); *Edw. Palmer 78* (E, F, G). She

says that this is "A species closely related to *V. menthaefolia* and *V. officinalis*, but readily distinguished by the diverse outline of the leaves and the somewhat more slender achenes."

In all, 927 herbarium specimens, including type material of almost all the names involved, and 3 mounted photographs and clippings have been examined by me.

Citations: NORTH CAROLINA: Warren Co.: C. R. Bell 4366 (Hi--92963, N). SOUTH CAROLINA: Sumter Co.: A. E. Radford 20975 (Hi--131515). GEORGIA: Burke Co.: A. R. Moldenke 410 (Fg). Crawford Co.: D. E. Eyles 2928 (Sa). Turner Co.: B. B. Higgins s.n. [Ashburn, 3-5-33] (Ga). Sapelo Island (McIntosh Co.): W. H. Duncan 20214 (Au--167533, Gg--413462, Hi--106743, W--2262552). FLORIDA: Alachua Co.: M. F. Baker s.n. [May 2, 1933] (Bu); E. S. Ford s.n. [Gainesville, 25 April 1948] (Gu--30804); Janish & Janish 270 (Du--392745); Murrill s.n. [Gainesville, Apr. 15, 1933] (Fl--51); F. H. Sargent 6207 (St, We); G. F. Weber s.n. [Arredonda, 4-18-28] (Fl--21116); E. West s.n. [Alachua, 2 May 1934] (Fl--21110). Jackson Co.: R. K. Godfrey 53168 (N, S). Leon Co.: R. K. Godfrey 56533a (Ca--95456). ALABAMA: Baldwin Co.: Ahles & Bell 7745 (Ur). Mobile Co.: Blakely s.n. [4/5/42] (Mi); G. Een s.n. [29.3.1951] (S). MISSISSIPPI: Hancock Co.: Demaree 35138 (Ss); Diener 214 (Ur); A. E. Radford 7892 (Hi--146195). Harrison Co.: Demaree 32070 (Le), 33307 (Cb, Cb, Z), 33708 (Ss); S. M. Tracy s.n. [Biloxi, 6/9/00](N). Jackson Co.: Demaree 33625 (Cb, Ss), 34896 (Ss); H. J. Jacob 1296 (Hi--196294); J. Skehan 109a (Au--180342), 1599 (Mi), s.n. [Seymour & Earle 109] (Gg--364185, Hi--59463, Ur), s.n. [Seymour & Earle 109a] (Ld), s.n. (Ur--22596). Jefferson Co.: McDougall 1291 (W--1925706). Stone Co.: Demaree 32532 (Le). Ship Island: Demaree 30585 (Hi--51390, Mi, N, Ok, St, We), 30710 (N). ARKANSAS: Calhoun Co.: Demaree 22711 (N, Sm). Drew Co.: Demaree 24933 (Sm). Hempstead Co.: Demaree 42704 (Gg). Miller Co.: Demaree 39156 (Sm, Sm), 40819 (Bm). Stone Co.: Demaree 31874 (Bm). Union Co.: D. M. Moore 510154 (St). Washington Co.: Brackett 253 [April 21, 1938] (Au). LOUISIANA: Acadia Par.: Penfound s.n. [April 21, 1940] (Tl); F. W. Pennell 10201 (N). Calcasieu Par.: A. R. Moldenke 228 (Fg); Small & Wherry 11774 (N), s.n. [near Lake Charles, April 11, 1925] (W--1739114). Cameron Par.: McAtee 1753 (W--644943); S. M. Tracy 5709 (Tl), 8709 (Es, N, Tr, Up--50345, W--510601). Iberia Par.: Ashbey 129 (Tl). Iberville Par.: J. H. Barnhart 2825 [Herb. Barnhart 3347] (N). Jefferson Par.: C. R. Ball 344 (N, W--382729). Natchitoches Par.: Biology Class 302 no. 2163 [L. E. Fox 2163] (Nc); E. J. Palmer 7369 (Gg--132151, W--1531619). Orleans Par.: Brenning s.n. [17.6.1904] (B); Cocks s.n. [May 1903] (Tl); C. Mohr s.n. [N. Orleans] (W--771864); Riddell s.n. [New Orleans] (T). Plaquemines Par.: Langlois s.n. [28 Mai 1883] (Du--90896). Rapides Par.: Ewan 19377 (Tl). Saint James Par.: Small & Alexander s.n. [near Convent, Apr. 1931] (Au, H--82843, N, N, N, We). Saint Martin Par.: Langlois s.n. [April 1880] (I). Saint Tammany Par.: Arsène 11831 (W--1033026), 12242 (W--1033052); Cocks s.n. [Slidell, Apr.] (Tl)..Tangipahoa Par.: Correll & Correll 9254 (H--78937, N). Union Par.: R. Kral 8673 (Hi--151002). Vernon Par.: Cooley & Brass 3762 (Tl). Parish undetermined: Hale s.n. (T--type); Riddell 1268 (N). OKLAHOMA: Atoka Co.: Hopkins, Nelson, & Nelson 1092 (Ok). Bryan Co.: C. S. Sheldon 23 (Ob--97289, W). Caddo Co.: Edw. Palmer 242 (W). Carter Co.: A. G. Payne 38 (Ok). Choctaw Co.: Waterfall 2102 (N, Ok). Jefferson Co.: Waterfall 7829 (Au--122278, Ok, St). Johnston Co.: Edw. Palmer 242 [339] (T); G. T. Robbins 2410 (Ca--966184, Ok). Latimer Co.: Hopkins & Cross 1732 (Ba, Ok). Leflore Co.: R. Bebb 5398 (Ok, St--19588). Love Co.: E. E. Dale 824 (Ok); Nelson, Nelson, Goodman, & Waterfall 5706 (Ok); Waterfall 7254 (Ok). Marshall Co.: Alder s.n. [July 10, 1950] (Ok); Cory 58996 (St); V. E. Dowell s.n. [April 22, 1955] (Ok); G. J. Goodman 6458 (Bm, Bs, Mm, Ok, Sm); Kelting 193 (Ok); P. B. Riggs s.n. [Lake Texoma, June 20, 1952] (S); Starks s.n. [19 July 1950] (Ok). McCurtain Co.: Waterfall 8057 (Ok), 8825 (Ok, St), 10470 (St), 11829 (Au--122277, Ok, St, W--2231103). Murray Co.: Stratton 62 (St--26122). Muskogee Co.: C. S. Wallis 2219 (St). Pontotoc Co.: G. T. Robbins 2486 (Ca--966181, Ok). Pushmataha Co.: Waterfall 631 (Ok), s.n. [Kiamichi, June 3, 1937] (Ms). County undetermined: C. S. Carleton 23 [Indian Territory] (W). TEXAS: Anderson Co.: Hardin 531 (Hi--111003, Mi, W--2327763); E. G. Marsh 52 (Au--122130), 57-61 (Au--122235); E. D. Schulz s.n. [Palestine, 1930] (Wi); K. E. Smith s.n. [Palestine, 4/21/35] (Au, Bt--25428, N, St--9254); Tharp s.n. [Palestine, 4/21/35] (Du--362690). Angelina Co.: Parks & Cory 10651 (Tr). Aransas Co.: Cory 49034 (Sm); M. C. Johnston 53253,8 (Au--122164), 53253.12 (Au--122232). Archer Co.: Henon s.n. [Archer City, April 10, 1934] (Au, Au); Whitehouse 9721 (Mi, N). Atascosa Co.: Parks & Cory 19174 (Tr). Austin Co.: H. Wurzlow s.n. [Industry, 1891] (Ur). Bastrop Co.: C. C. C. Plant Project s.n. [Bastrop State Park, Nov.--Dec. 1936] (Au); Lundell & Lundell 10344 (Ld, N); B. H. Warnock 46283 (Au), 46284 (Au, N, Ok, St); Westlund, Rowell, & Barkley 17T216 (Au, N). Bee Co.: F. A. Barkley 16T421 (Au, N, Or--55408, S, Vi); Cory 54133 (Rf); Lundell & Lundell 10051 (N). Bell Co.: Cohn T.11 (Au, N); Cohn & Barkley T.44 (Au); S. E. Wolff 2948 (Tr, Tr--16164, W--1624016), 3491 (Tr, Tr--23397), 3718 (Tr--19170); York & York 53053 (Ok). Bexar Co.: C. R. Ball 927a (W--501547); R. Bebb 2282 (Ok); Burr

49 (N); L. D. Christensen 38 (Ar--250852); Clemens & Clemens 502 (Po--69601), 969 (Po--69887), 970 (Po--69572); Groth 75 (Gg--31399, N, W--717689); Havard s.n. [San Antonio] (W--155634, W--218876); Headley s.n. [March 24, 1907] (I); G. Jermy 87, in part (W--315686), 88 (W--315687); L. G. McLean 84 (St); Meadows s.n. [April 20, 1941] (Au); Metz 62 (I), 75 (I), 3240 (Au, N); M. O. Rice s.n. [San Antonio, April 18, 1938] (St); E. D. Schulz 103 (W--1102680), 518 (N, W--1074945, Wi, Wi), 766 (N, W--1243197, Wi), s.n. [San Antonio, 4-14-1922] (Au), s.n. [Spr. 1926] (Mi), s.n. [San Antonio, 4-14-32] (Mi), s.n. [9 mi. so. San Antonio] (Wi); C. Skottsberg s.n. [San Antonio, 2/6/1935] (Go); Texas Agr. Exp. Sta. Herb. Exchange 3495 (Hp); Whelan 171 (N). Bowie Co.: Correll & Correll 12421 (Ca--907254, Sm); Eggert s.n. [13 June 1898] (N); Milligan s.n. [Dalby, May 1891] (W--504335). Brazoria Co.: B. F. Bush 77 (Hi--59461, N, S, W--336410); E. J. Palmer 5044 (Po--217659); Tharp 50-106 (Au--122217); M. S. Young s.n. [Alvin, 4/22/18] (Po--161329). Brazos Co.: Buechner s.n. [3-19-46] (Au); Chenault s.n. [April 12, 1937] (N); Cory 50627 (Ld); F. W. Gould 253 (Au--122234), 5436 (Ca--917763, S, Ur); 6644 (Ca--373888, St); C. E. Gray 23 (Mi); H. S. Jennings s.n. [College, Mar. 31, '70] (Mi); Lake s.n. [May 1890] (Pr); Ness s.n. [Apr. 15, 1926] (Tr); E. J. Palmer 11715 (Ca--425594); L. H. Pammel s.n. [College Station, 7-1388] (Io--15349); H. B. Parks s.n. [4-13-47] (Au), s.n. [4-30-47] (Au); E. L. Reed s.n. [College Station, Oct. 1915] (N); Reeves 139 (N), 193 (N), 196 (Cs), 208 (Cs); J. N. Weaver 490 (Ld, Mi). Brewster Co.: Hinckley & Warnock 4096 (N); O. E. Sperry 583 (W--1699323); B. H. Warnock 3482 (Rf), W.538 (Au, N); Warnock & Hinckley BG.108 (Rf). Brooks Co.: C. L. Lundell 10811 (Rf, Sm); S. Williams 96 (Ok). Brown Co.: B. L. Sweet s.n. [Brownwood, 5-28-1931] (Au, Au). Burleson Co.: Herb. Univ. Texas s.n. [Lyons, Spring 1928] (Au), s.n. [Somerville, Spr. 1930] (Au). Burnet Co.: Rose-Innes & Warnock 798 (Au). Calhoun Co.: H. S. Gentry 29 (Au, N, S); Tharp s.n. [Port O'Connor, 5/19/30] (Ca--882647). Caldwell Co.: McBryde s.n. [Spr.-Sum. '31] (Au). Calhoun Co.: Trew 211 (Au--122176). Callahan Co.: Kirn s.n. [Putnam, Apr. 1926] (Wi). Cameron Co.: H. E. Cannon s.n. [Santa Rosa, Nov. 21, 1926] (Mi); M. Cannon s.n. [Santa Rosa, Feb. 9, 1927] (Mi, Mi); H. P. Chandler 7082 (Ca--174503, N, W--504573); Clover 736 (Mi); L. I. Davis s.n. [Palm Grove, Summer '41] (Au, Sm, St); Ewan 15551 (Tl); M. C. Johnston 253-8 (Au--122139); C. L. Lundell 10639 (N, Rf); Lundell & Lundell 8623 (Ld, Mi, N); Nealley 115/370 (W); R. Runyon 1777, in part (Rr, Rr), 2181 (Rr, Rr), 2368 (N, N), s.n. [Browns-

ville, 1930] (Hp); Tharp 1372 (Au); Tharp, Gimbrede, & Johnston 52-523 (Au--122190). Cass Co.: McClung s.n. [6-15-26] (Au). Chambers Co.: L. Barrow 31 (Au, Au); Tharp s.n. [4/7--10/36] (Au, Mi). Cherokee Co.: F. A. Barkley 13585 (Au, N); High School s.n. (Au). Coleman Co.: B. H. Warnock 46341 (Au, N). Collin Co.: Lundell & Lundell 9313 (Du--321633, N). Colorado Co.: Biology Class 19 (Au); B. H. Warnock 46430 (Au, N), 46432 (Au); Wild Flower Contest s.n. [Eagle Lake, Oct. 1930] (Au). Comal Co.: Landa 14081 (Tr); Lindheimer 537 (Ka), 1076 (Au, Br, Ca--147515, Ca--176885, Me, Me, Me, N, Ok--10360, Up--48537, W--502449). Cooke Co.: E. E. Russell s.n. [Gainesville, 5-23-1923] (Au). Culberson Co.: Cory 53037 (N); Waterfall 4496 (N, Ok, Ok). Dallas Co.: Boll s.n. [1871] (Cb); Cory 53699 (N); Hamric 21 (Au--168941); Hynes s.n. [Dallas, May 2, '25] (Au); M. E. Jones s.n. [Dallas] (Po--70677); Lundell & Lundell 8344 (Mi), 8346 (Ld, Mi), 8578 (Ld, Mi, N), 10398 (Ld, N, W-1887663), 12107 (N, Rf); J. Reverchon 732 (W); Shinners 8505 (Sm); M. B. Stephenson 200 (W--1580534); R. Van Vleet 86 (Au); Walden 13 (Nt); Wilfong 82 (Sm). Denton Co.: McCart 1977 (Au--122231), 2006 (Au, Mi, St--14716); Whitehouse 15785 (Sm). DeWitt Co.: Blanch 17 (Ok); A. H. Howell 313 (W--501462); M. Riedel s.n. [9-26-41] (Au); E. D. Schulz 2502 (W--1521151, Wi). Dimmit Co.: Alvarez, Guajardo, Salazar, & McCart 7619 (Ok); D. S. Correll 20735 (Rf); Correll & Johnston 19473 (Rf). Duval Co.: Alvarez, Guajardo, Salazar, & McCart 7671 (Ok); Croft 119 (C, Ga), s.n. [San Diego, 1885] (Mi); R. Garza 47 (Ok); H. J. Hamby 747 (Ar--206292); M. C. Johnston 54107 (Au--122237, St). Eastland Co.: Herb. Univ. Texas s.n. [Sept. 11, 1931] (Au); Mrs. Robinson s.n. [Ranger, 9-11-31] (Au, Au). Ellis Co.: O. Sanders 19 (Mi). Erath Co.: Hoisington 27 (Au--122891), 84 (Ok), 241 (Ok). Falls Co.: A. H. Howell 362 (W--501510). Fayette Co.: Barkley, Warnock, & Tharp 46350 (Au, N); Parks & Cory 10072 (Tr--16171); Ripple 51-579 (Au--122215); B. H. Warnock 46285 (N, N, S), 46287 (Au, N, N), 46436 (Au, N, S). Frio Co.: Johnston, Tharp, & Turner 3461 (Au--122248); Lundell & Lundell 10139 (Ld, N); Parks & Cory 12748 (Tr); Wolcott & Barkley 16T265 (Au, N). Galveston Co.: R. Bebb 1131 (Ok), 1481 (Ok); Cory 51017 (N, Sm); R. L. Crockett s.n. [Apr. 22, 1944] (Au); G. L. Fisher 189 (W--1074623), s.n. [Galveston, June 6, 1920] (H--5469, Ur); C. S. Wallis 8266 (St, St). Gillespie Co.: Bryant & Bryant 3 (Ca--990129, Ok); G. Jermy 203 (W). Goliad Co.: Lundell & Lundell 10060 (Ld, Ld, N). Gonzales Co.: M. L. Fernandez 58 (Ok); Parks & Cory 5948 (Tr), 18239 (Tr); C. G. Ward 288 (St--16874). Grayson Co.: Center 3 (Nt); H. S. Gentry 50-198 (Au--122213), 185 (Au); G. Graham 35 (Au, Au), s.n. [Denison, 5/2/32] (Au); MacGarland 43 (Au); Cyster s.n. [Denison, May 21, 1883] (Mi). Gregg Co.: F. W. Johnson 1766 (N); C. L. York s.n. [Fall 1937] (Au), s.n. [4-2-33] (Au). Grimes Co.: Harding 579 (St--20287); J. N. Weaver 1038 (N); T. V. Weaver 1038 (Ml). Harris Co.: L. Anderson s.n. [Sept.--Oct. 1936] (Au); E. Boon 62 (Au, Ca--882646, N, W--2311324), 290 (Au, N); B. F. Bush 23 (N, W--386382); G. L. Fisher 20 (W--503094), s.n. [Houston, Apr. 14, 1912] (Vi), s.n. [Houston, Apr. 23, 1914] (Hp), s.n. [Houston, Apr. 9, 1931] (Bt--33827, Du--283966, Gg--222540, St--17432), s.n. [Houston, May 2, 1934] (Ew, Ms); Fitzgerald 3933 (Bl--42306); E. Hall 432 (N, Po--70678, Pr, W); Hayden s.n. [Houston, 1917] (Io--100110); Joor 121 (Mi); Killip 45697 (W--2234118); Kuntze 233 (N); Penfound 1-19 (Au, Au), s.n. [April 10, 1936] (Tl); Rose-Innes & Warnock 673 (Au, N); Snyder s.n. [Cypress, summer 1905] (Sd--4259), s.n. [Cypress, 1906] (Ca--185369); Thurow s.n. [Houston Heights, April 15, 1923] (Hu). Hays Co.: S. W. Stanfield s.n. [San Marcos, July 1897] (N). Henderson Co.: J. E. Brenckle 48067 (N, W--2003824). Hidalgo Co.: Clover 600 (Mi, Mi), 672 (Mi); Fleetwood 3061 (Au--180171); Lundell & Lundell 10035 (N); Painter & Barkley 14428 (Au, N); R. Runyon 2583 (N, N). Hill Co.: H. Rogers 22 (N, Nt). Hood Co.: Blackwell 44 (Nt); Herb. Univ. Texas s.n. [Granbury, May 30, 1927] (Au); Waples School s.n. [Granbury, 5.30.27] (Au). Houston Co.: Lewis & Stripling 5293 (Mb); C. Walker 3174 (Nt). Hunt Co.: Wolff 3359 (Tr). Hutchinson Co.: M. Shepard 30 (Au), s.n. [June 1934] (Au). Jackson Co.: A. R. Moldenke 205 (Fg); Tharp & Barkley 13A114 (Au, Ml, N, N). Jasper Co.: Lundell & Lundell 10513 (Ld, N); Mrs. A. C. Rowe s.n. [Jasper, 1905] (Ms). Jefferson Co.: J. F. Brenckle 48070 (N); Kolthoff s.n. [4 Maj 1927] (S, S); C. L. Lundell 11250 (Sm). Jim Hogg Co.: Salazar & Santos 32 (Ok, Ok). Jim Wells Co.: H. J. Hamby 664 (Ar--206303); M. C. Johnston 54089 (Au--122247); Lewis & Oliver 5431 (Mb); Lundell & Lundell 10076 (N); Muenscher & Muenscher 14391 (N); Wagner & Barkley 16T320 (Au, N), 16T321 (Au, N), 16T322, in part (N). Karnes Co.: J. C. Johnson 822 (Hk, Ld). Kaufman Co.: Lundell & Lundell 8506 (Ld, Mi); F. J. Tyler s.n. [vicinity of Terrell, April 25, 1904] (W--500803). Kenedy Co.: Cory 28405 (N); S. F. Glassman 2201 (Ok); M. C. Johnston 53253.5 (Au--122244), 54276 (Au--122245), 541058 (Au--122155); Lundell & Lundell 10728 (N, Rf), 10344 (Rf), 10347 (Rf), 19844 (Ld), 19347 (N); A. R. Moldenke 195 (Fg); R. Runyon 2358 (N, N, N); Tharp 5902 (Au); Wagner & Barkley 16T392 (Au, N), 16T393 (Au, N). Kerr Co.: M. E. Jones 23294 (Gg--237367); E. J. Palmer 10037 (Bi, Du--205594, S, W--1532020). Kimble Co.: O. Degener 5056 (N). Kleberg Co.: Benke 5417 (N); Cory 51322 (N, Sm); J. Johnson 10 (Au, Au); M. C. Johnston 53253.10 (Au--122158), 53253.11 (Au--122246), 53253.16 (Au--122241), 53253.16a (Au--122239), 53253.17 (Au--122249), 53253.17a (Au--122233), 53253.18 (Au--122252); R. Runyon 4232 (N, Sm); J. F. Sinclair s.n. [Kingsville, summer 1940] (Au); Tharp & York 51-230 (Au--122145). La Salle Co.: F. A. Barkley 17T077 (Au, Au--178081, N); Lundell & Lundell 10143 (Ld, N). Lavaca Co.: Tharp, Rogers, & York 49162 (Au--122177). Leon Co.: R. W. Long 231 (Hi--205308, N); Lundell & Lundell 10391 (Ld, N); E. C. Smith s.n. [Oakwood, 5-4-1942] (Fc); Tharp, Turner, & Johnston 54973 (Au--122174). Liberty Co.: A. R. Moldenke 220 (Fg). Llano Co.: G. L. Fisher s.n. [Bluffton, May 31, 1936] (Ms); M. E. Jones 29187 (Bm, Po--199866); Kelting 38 (Ok); Lee, Barkley, & Tharp 47282 (Au, N); Lundell & Lundell 9040 (Ld, Mi); Parks & Cory 6280 (Tr); M. E. Watts 28 (Au); S. E. Wolff 3067 (Tr--16165, Tr--22251, W--1624021), 3825 (Tr--16166). Matagorda Co.: Cory 51091 (Sm); Tharp 1403 (Au); Walter 51 (Au); B. H. Warnock 46308 (Au, N), 46312 (Au, N). Maverick Co.: M. E. Jones 28295 (Po--187970). McLennan Co.: L. D. Smith 388 (St), 847 (Au--122170); C. L. York 46087, in part (Au), 46100, in part (Au). Milam Co.: Lundell & Lundell 10374 (Ld, N); Wolff 3620 (Tr). Montague Co.: McCart 1634 (Au, N, Nt). Montgomery Co.: Warner 66 (Hu). Morris Co.: Correll, Johnston, & Edwin 22158 (Ld). Nacogdoches Co.: W. H. Lewis 5276 (Mb); Tharp & Brown 53-51 (Au--122078). Navarro Co.: Cory 51533 (Sm); Mitcham 42 (Au); Purdue 7 (Au). Nueces Co.: A. A. Heller 1419 (C, Ca--104376, Mm-15397, W--213687); Tharp 5603 (Au, W--1468816); S. M. Tracy s.n. [3/14/05] (Tr--16172), s.n. [Corpus Christi, 3-31-1905] (Tr--8120); B. H. Warnock 20999 (Au). Orange Co.: J. K. Small s.n. [April 11, 1925] (Fl--29058); Small & Wherry 11801 (N); Wild Wood Club s.n. [Orange, Apr. 25, 1931] (Au); M. S. Young 167 (Ur), 253 (Au). Palo Pinto Co.: Culwell & Timmons 3068 (Nt); J. W. Gillespie 5214 (Du--210195); Lindheimer 77 [I.155] (E--118196), 155 (Ca--248432). Parker Co.: C. L. York 7 (Au--122129). Pecos Co.: B. H. Warnock 46166 (Au). Polk Co.: Girvin s.n. [April 12, 1940] (Au, Au); Tharp s.n. [7-23-39] (Au), s.n. [4-12-42] (Au); Tharp, Turner, & Johnston 54704 (Au--122126). Reeves Co.: Waterfall 4388 (N, Ok, Ok, Tu--31202). Refugio Co.: Lundell & Lundell 10856 (N, Rf); A. R. Moldenke 196 (Fg); E. J. Palmer 9111 (Bi, Du--205599, S, W--1531877). Robertson Co.: Rowell 3029 (Mi, N); W. H. Seaman s.n. [Hearne, 11-9-1877] (W--787347); J. B. Walker 75 (W--2133168); L. F. Ward s.n. [Hearne, Sept. 11, 1877] (W--147568); S. E. Wolff 458 (W--1623883). Runnels Co.: J. C. Johnson 650 (Au--122214). Rusk Co.: C. E. Porter 51-1830 (Au--122216). San Augustine Co.: E. J. Palmer 9485 (Bi, Du--205591, S, W--1531929). San Patricio Co.: Cory 51259 (Ca--754834, N, Sm);

Lundell & Lundell 10082 (N); McKelvey 1725 (W--1581388); E. D. Schulz 855 (Wi), 2812 (Wi, Wi), s.n. [Aransas Pass, May 1926] (Wi); Tharp s.n. [Sinton prairie, 3/23/31] (Au); Tharp & Brown 48-203 (Au--122179, N, St), 48-203a (St); Williges 4-W (Au--175509), 15 (Au--175628), 305 (Au--179712); Wolcott & Barkley 16T405 (Au, N). Shelby Co.: Correll, Johnston, & Edwin 22223 (Ld). Smith Co.: H. E. Moore Jr. 529 (W--1897357). Starr Co.: Lundell & Lundell 9924 (Ld, N). Tarrant Co.: F. C. Gates 19133 (Ka--89647); Killian 6953 (Au, W--1465340); Lundell & Lundell 8522 (Ld, Mi, N); Ruth 84 (Au), 93 (Ll), 108 (Cm, Io--113613, Ka, N, N, N, Up, Ur, W--501768), s.n. [Fort Worth, June 5, 1909] (Po--267665); Wilczek 36 (Cb). Taylor Co.: S. M. Tracy 7996 (Au, Cm, Es, N, N--photo, Vt, W--500366, Z--photo). Terrell Co.: Farr s.n. [Sanderson, May 8, 1911] (Up--52680). Throckmorton Co.: Wild Flower Contest s.n. [Throckmorton, April 1935] (Au). Tom Green Co.: C. Smith 151 (Ok). Travis Co.: C. C. Albers 33016 (Au); Armer 5385 (Au, Au, W--1438998), s.n. [Austin, 4.23.29] (Go); Barkley & Rowell 7057 (Au, N); Biltmore Herb. 14737a (S); Bogusch s.n. [March 26, 1926] (Ob--50791); L. C. Chambers 3033 (W--697808); Cohn & Barkley 13253 (Au, Ca--882529); Collector undesignated s.n. (Au); A. M. Ferguson s.n. [4/27/01] (Au); Lundell & Lundell 10308 (Ld, N, W--1888931); Mahler 1267 (St); McWilliams 4651 (Au); E. D. Schulz s.n. [Austin, 6-30-1920] (Wi); Tharp 1529 (Au), 2818 (W--1221373), s.n. [Austin, 4/23/29] (Au, N, N, Pl--151577, Vi, We), s.n. [Austin, 5/2/35] (Au, Bt--25424, St--9253), s.n. [Austin, 5/9/35] (Au, Du--362688, St--9252), s.n. [Deep Eddy, 4-26-36] (Au), s.n. [Austin, 7/15/38] (Au, Au); B. H. Warnock 45-5 (Au), 46104 (Au, Ok, S, Vi); Werquithin s.n. [Austin, 5/14/15] (Io--102277); Westler J. Y. T. S. s.n. [Austin, May 1930] (Mi); Wheeler, Buck, & Barkley 16T248 (Au, N); M. S. Young 77 (Au), s.n. [4/5/18] (Au). Tyler Co.: Tharp, Turner, & Johnston 54840 (Au--122125). Uvalde Co.: M. E. Jones s.n. [west of Uvalde, April 26, 1931] (Ca--479073, Du--230896, Po--187973); C. L. Lundell 10965 (N, Rf); E. J. Palmer 13564 (B, W--1603487), 33604 (N); Small & Wherry 11998 (N). Val Verde Co.: Cory s.n. [Del Rio, 3-18-1927] (Tr); M. E. Jones 26229, in part (Gg--237870, I, La, Mn-22066, Po--178355); A. R. Moldenke 172 (Fg); Parks, Warnock, & Turner 254 (Rf, Rf); B. H. Warnock 11361 (Rf); Warnock & Cameron 9893 (Rf). Van Zandt Co.: Beckham s.n. [Wills Point, 1930] (Au); Ezell 23 (Au), 5699 (W--1463815); B. Williams 10 (Mt). Victoria Co.: F. L. Lewton 37 (Ar--271653), 763 (Ar--271747); Maxon 3822 (W--500447); McVaugh 12422 (Mi); A. R. Moldenke 203 (Fg). Walker Co.: Parks & Cory 7883 (Tr), 20238 (Tr); Tharp s.n. [6/11/35] (Sm). Waller Co.: Dooley 2 (Au, N); Thurow s.n. [May 10th, 1890]

(Hu). Washington Co.: C. C. Albers 33017, in part (Au); Brackett 253 [March 29, 1938] (Au), s.n. [April 21, 1939] (Au); U. Lehman [Brenham, 4-21-34] (Au). Webb Co.: Cantu, Villa, & McCart 74 (Ok); K. K. Mackenzie 96 (N); McCart 7242 (Ok, Ok); Perkins & Hall 2627, in part (Po--256897). Wharton Co.: A. R. Moldenke 209 (Fg); B. H. Warnock 46421 (Au, N). Wichita Co.: Ferris & Duncan 3337 (Du--125422, Gg--31404, N); Whitehouse 10474 (Mi, N). Willacy Co.: J. F. Brenckle 47-361 (N); Cory 51489 (Sm); Davis & Johnston 53253.22 (Au--122250), 53253.23 (Au--122251); M. C. Johnston 53253.9 (Au--122161), 54164 (Au--122243); Lewis & Oliver 5424 (Nb); Lundell & Lundell 8786 (Ld, Mi, N); Tharp s.n. [Redfish Bay, Mar. 5, 1934] (Au), s.n. [Nov. 30, 1940] (Vi). Wilson Co.: Thompson & Graham 52 (Au--123189). Wise Co.: McCart 1647 (N, Nt). Young Co.: Correll & Johnston 22127 (Ld); S. Hayes 606 (Ms, N); Parks & Cory 13145 (Tr); Whitehouse 15324 (N). County undetermined: Belfrage s.n. [Texas, 1860] (S); Berlandier 3011 (Cb), 3016 (W); Black 38-5940 (Be--46632); Collector undesignated s.n. (Nt); Herb. Univ. Texas s.n. [April 23, 1929] (Au); A. M. Hildebrandt s.n. (W--329997); Lindheimer I.155 (W--1870924), s.n. [Dry prairies on the Brazos, Aug. 1843] (E--113198), s.n. [Southern Texas, 1849--51] (N), s.n. [Texas] (W--771866); E. Meyer s.n. [Texas, 1844] (W--264612); Edw. Palmer 34 [Yaqui River] (W), 1043 [sw. Texas] (W, W--1323112); Reeves 204 (Cs), 207 (Cs); G. Sims 42 (Ok--10368); Tharp s.n. (Au); L. F. Ward s.n. [Texas, Sept. 11, 1877] (W--147582). Dunham Island: Tharp 1622 (Au, Au). El Toro Island: Tharp 49098 (St, W--1972910), 49236 (St). Galveston Island: E. D. Schulz s.n. [Galveston Island, 7/30/1938] (Wi); S. M. Tracy 7533 (Au, Cm, Es, Io--48366, N, W--442190). Green Island: Tharp 1200 (Au). Mustang Island: H. Hildebrand 86 (Au--122173, St). NEW MEXICO: Otero Co.: M. E. Jones 26229 (Du--235292). ARIZONA: Pinal Co.: Goodding & Lusher 136-45 (N, Or--55219); Peebles & Harrison 4224 (La). MEXICO: Chihuahua: Pringle s.n. [Valley, Ortiz, Apr. 11, 1887] (Gg--421277, N, St). Coahuila: G. L. Fisher 4416 (Ew, Ew, N), 4416b (Ew, Gg--353404); E. G. Marsh 1625 (St), 2128 (St). Durango: Waterfall & Wallis 13371 (St). Nuevo León: Arsène s.n. [Sta. Catarina, 7-1911] (B, N); Frye & Frye 2474 (Se--65787, W--1791011). Querétaro: Agniel s.n. [Arsène 10242] (Ur). Sinaloa: H. S. Gentry 7011 (W--1945099). Sonora: K. F. Parker 8204 (Ca--993702, Gg--382132). Tamaulipas: Berlandier 1511 (T), 3016 (Cb); Brenning s.n. [Tampico, 21.5.1904] (B); Graham & Johnston 4710b (Au--174987); LeSueur 399 (Au, Fs); Lewis & Oliver 5422 (Nb); Edw. Palmer 78 (Em, Gg--31397, N, W--463015). Vera Cruz: L. I. Davis s.n. [near Tecolutla, 6-24-47] (Au--123240); Rutten & Rutten-Pekelharing 473 (Ut--3100b). LOCALI-

ITY OF COLLECTION UNDETERMINED: *Collector undesignated s.n.* [Col. Ter., 1875] (Up--17113). MOUNTED CLIPPINGS: Bull. Torrey Bot. Club 25: 617. 1898 (W).

VERBENA HALEI f. ALBIFLORA L. I. Davis, Nature Leaflet [Lower Rio Grande Valley Nat. Club] 2: [4]. 1945.

Bibliography: L. I. Davis, Nature Leaflet [Lower Rio Grande Valley Nat. Club] 2: [4]. 1945; Moldenke, Am. Journ. Bot. 32: 610. 1945; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24 & 198. 1949; Moldenke, Résumé 29 & 471. 1959.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by L. Irby Davis near Falfurrias, Brooks County, Texas, in June, 1942, and is deposited in the herbarium of the University of Texas at Austin. The collector states that other specimens of this form have been gathered in the Rio Grande Delta region of Hidalgo County, Texas. As yet I have not seen any material of it.

VERBENA HALEI f. ROSEIFLORA (Benke) Moldenke, Phytologia 1: 459. 1940.

Synonymy: *Verbena officinalis* f. *roseiflora* Benke, Rhodora 35: 45. 1933. *Verbena officinalis* f. *rosea* Blackwell ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962.

Bibliography: Benke, Rhodora 35: 45. 1933; Moldenke, Phytologia 1: 459 (1940) and 1: 511. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 16 & 23. 1942; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 13 & 101. 1942; Moldenke, Alph. List Cit. 1: 43 (1946) and 4: 1129. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24 & 198. 1949; Moldenke, Résumé 29, 371, & 471. 1959; Moldenke, Résumé Suppl. 3: 40. 1962.

This form differs from the typical form of the species only in having the corollas pink, purplish-pink, deep-rose, or bright-rose in color.

The type of this form was collected by Hermann Conrad Benke (*no. 5413*) at Kingsberg, Kleberg County, Texas, on March 28, 1930, and is deposited in the herbarium of the Chicago Natural History Museum. Although known thus far only from three collections, it is probable that this color form is coextensive in range with the typical form of the species and has an equally long blooming period. It has been found in sandy meadows, blooming from March to May. Herbarium material has been misidentified and distributed as *V. halei* Small and *V. officinalis* L. In all, 5 herbarium specimens, including the type collection, have been examined by me.

Citations: TEXAS: Goliad Co.: *C. B. Williams 32* (Au). Hood Co.: *Blackwell 31* (Au, N, Mt). Kleberg Co.: *Benke 5413* (W--1571123--isotype).

VERBENA HARBISONII Moldenke, Phytologia 1: 438--439. 1940.

Bibliography: Moldenke, Phytologia 1: 438--439 (1940) and 1:

511. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 1 & 101. 1942; Moldenke, Alph. List Cit. 1: 256. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Alph. List Cit. 2: 483 (1948) and 4: 1242. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 198. 1949; Moldenke, Résumé 39 & 472. 1959.

Herb; stems erect, slender, rather acutely tetragonal, ridged, rather densely hirsutulous-pubescent with short, divergent, canescent hairs; branches similar but usually more densely canescent hirsutulous, ascending, short; internodes on stems usually elongated, 4--8 cm. long, more abbreviated on the branches; nodes plainly annulate; leaves decussate-opposite; petioles 3--10 mm. long, winged-margined, densely hirsutulous-pubescent with canescent hairs; leaf-blades chartaceous, uniformly green on both surfaces, 2--5.5 cm. long, 2--5 cm. wide, the larger ones deeply 3-parted practically to the base, the divisions lanceolate in outline, deeply and irregularly pinnatisect, all the lobes sharply acute at the apex, the margins slightly revolute, the lateral divisions widely divergent, the uppermost leaves much reduced, with linear divisions, all hirsutulous-pubescent above and on the venation beneath; venation slightly impressed above, prominent beneath; inflorescence spicate, rather long-pedunculate, terminating the upper branchlets; peduncles slender, acutely tetragonal, densely canescent-hirsutulous, 2--5.5 cm. long; spikes oblong, 1--2.5 cm. long, about 1.5 cm. wide, very densely many-flowered; bractlets lanceolate, equaling the calyx, 5--6 mm. long, about 1 mm. wide at the base, long-attenuate to a setaceous apex, densely hirsutulous with short hairs; calyx membranous, cylindric, its tube about 5 mm. long, 0.9 mm. wide at the base and 2.2 mm. wide at the apex, densely short-pubescent with spreading white hairs, its rim 5-lobed, the lobes about 2.5 mm. long, setulose, densely pubescent; corolla hypocrateriform, glabrous on the outside, its tube about 6.8 mm. long, the limb about 5 mm. in diameter, the lobes small, about 2 mm. long and wide, rounded and bifid at the apex; stamens 4, didynamous, inserted about 2.4 and 3.4 mm. below the mouth of the corolla-tube, included; filaments filiform, very short, 0.2--0.4 mm. long; anthers about 0.9 mm. long and 0.7 mm. wide, unappendaged; style capillary, about 4.9 mm. long, glabrous; ovary oblong, about 1.4 mm. long and 0.7 mm. wide, glabrous.

The type of this species was collected by Charles Francis Harbison -- in whose honor it is named -- at Agua del Refugio, Baja California, Mexico, on April 1, 1935, and is deposited in the herbarium of the San Diego Society of Natural Histroy at San Diego, California. The species is quite distinct from all the other known species of this region, although its affinity is apparently with V. setacea Perry, which it resembles. Its most obvious characters are its long-pedunculate, densely-flowered, oblong spikes, elongate setaceous bractlets, and deeply 3-parted leaves whose lobes are all plainly acute at the apex. The type collection is sometimes regarded as Harbison 11303, but this number seems to be a herbarium number rather than the collector's number. A note on the label of the type says "material from same lot determined as *Verbena* sp. by Ira L. Wiggins." Ferris identified the Dudley Herbarium specimen as *V. setacea* Perry. In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: MEXICO: Baja California: *C. F. Harbison s.n.* [Agua del Refugio, April 1, 1935] (Du--244976--isotype, Gg--328000--isotype, N--isotype, N--photo of type, Sd--11808--type, Z--photo of type).

VERBENA HASSLERANA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1056. 1904.

Synonymy: *Verbena phlogiflora* Chod. apud Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1056, in syn. 1904 [not *V. phlogiflora* Cham., 1832, nor Cham. & Schlecht., 1959]. *Verbena hassleriana* Briq. apud Prain, Ind. Kew. Suppl. 3: 187, sphalm. 1908. *Verbena hassleri* Briq. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. *Verbena paraguariensis* var. *latiuscula* Briq. ex Moldenke, Phytologia 2: 475, hyponym. 1948. *Verbena hasleriana* Briq. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1056. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 478. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Suppl. List Invalid Names 8 & 9. 1941; Moldenke, Lilloa 6: 330 (1941) and 8: 430. 1942; Moldenke, Alph. List Invalid Names 47 & 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 101. 1942; Moldenke, Lilloa 10: 385. 1944; Moldenke, Phytologia 2: 475. 1948; Moldenke, Alph. List Cit. 1: 263. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Castanea 13: 117--119. 1948; Moldenke, Alph. List Cit. 2: 599 (1948), 3: 666, 693, & 916 (1949), and 4: 1237 & 1249. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 99, 106, & 198. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Moldenke, Phytologia 4: 188. 1953; Angely, Pl. Paran. 7: 7. 1957; Moldenke, Résumé 110, 118, 127, 365, 371, 372, 417, & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Moldenke, Résumé Suppl. 3: 38. 1962.

Perennial herb. to 1 m. tall, robust; stems tall, green, plainly tetragonal, branched; branches ascending, retrorsely scabridulous; middle internodes 2--6 cm. long; leaves decussate-opposite; petioles winged above; leaf-blades oblong or ovate-oblong, the larger ones to 7 cm. long and 3 cm. wide, sometimes smaller and narrower, acute or subacute at the apex, convex on the margins below the middle, membranous, green on both surfaces, rounded-attenuate into the petiole at the base, rather coarsely doubly crenate, the upper teeth to 5 mm. long and 2--5 mm. apart, sometimes much smaller, scabridulous on both surfaces with small rigid antrorse hairs; venation somewhat prominulent and more rugose beneath; inflorescence terminal, spicate, abbreviated, about 3 cm. long, more or less shortly pedunculate, congested; bractlets lanceolate-subulate, very long, to 1.5 cm. long, subequaling the calyx, beautifully spreading pilose-ciliate; calyx long-tubular, urceolate after anthesis, about 1.5 cm. long, rather rigid spreading-ciliate, especially on the veins, the teeth unequal, the 3 posterior ones shorter, about 3 mm. long, subulate, the posterior (lower) 2 very long filiform-subulate, more than 5 mm. in length; corolla hypocrateriform, varying from violet to rose, bluish-rose, or bluish-red, its tube cylindric, surpassing the calyx-teeth by only about 2--3 mm., the limb spreading, about 1 cm. wide, the lobes obcordate; stamens included; style included, incrassate toward the apex and shortly bifid, after anthesis surpassing the calyx-teeth by about 5 mm.

The species is based on three collections by Emil Hassler -- in whose honor it is named. These collections are *no. 3550*, from a swamp at Tucangua, Paraguay, collected in November, 1900, and *nos. 6401* and *6464*, from a swamp near Tobaty, Paraguay, collected in September, 1900, all deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. *V. paraguariensis* var. *latiuscula* seems to have been based by Briquet on *Lindman A. 3905* from Paraguarí, collected in October, 1893, and later redetermined by him as *V. platensis* Spreng. Briquet says: "Le *V. hasslerana* appartient au groupe de *V. megapotamica*, *chamaedryfolia*, *platensis* etc. comme affinités générales, mais il s'écarte de toutes les espèces connues de ce groupe par son indument scabre, ses bractées aussi longues que les calices et ses dents calicinales longuement subulées-filiformes. C'est une type de premier ordre."

The species inhabits bogs and swamps, campos, and land adjacent to rivers, from 750 to 1200 meters altitude. Jörgensen says that it is common in thickets in shrubby marshlands. It has been collected in anthesis from September to December and in February. A common name for it is "flor de vovia". In all, 20 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: *Rambo 52102* (S). Santa Catarina: *Smith & Reitz 3876* (Ok, W--2251458), *3933* (W--2251470, Z), *11392* (W--2249376). PARAGUAY: *Hassler 6464* [Macbride photos 24685] (Ca--944360--cotype, Kr--photo of cotype, N--cotype, N--photo of cotype, S--cotype, Tl--cotype, W--2055198--cotype); *Jörgensen 3769*, in part (Du--197903, W--1483663); *Lindman A.3905* (S). ARGENTINA: Misiones: *Grüner 1044* [Herb. Osten 23181] (N, Ug); *Ruiz Huidobro 4753* (Gg--353220, N); *G. J. Schwarz 3440* (N, S).

VERBENA HASSLERANA var. OVATIFOLIA Moldenke, Phytologia 6: 330. 1958.

Bibliography: Moldenke, Phytologia 6: 330. 1958; Moldenke, Résumé 110 & 472. 1959.

This variety differs from the typical form of the species in having its leaf-blades much smaller, ovate, 1.8--3.3 cm. long, 0.6--2 cm. wide, and the filiform petioles only 4--5 mm. long.

The type of the variety was collected by Lyman Bradford Smith and R. Klein (no. 3478) in ruderal situations at Rio Negrinho, municipality of Rio Negrinho, Santa Catarina, Brazil, on December 8, 1956, and is deposited in my personal herbarium at Yonkers, New York. The plant has also been found on riverbanks, and appears to grow at altitudes of 900 to 1200 meters. It has been collected in anthesis in December and February. Smith & Klein 11638 is a mixture with something non-verbenaceous.

In all, 7 herbarium specimens, including the type, have been examined by me.

Citations: BRAZIL: Santa Catarina: Smith & Klein 3478 (W--2251403--isotype, Z--type), 11638, in part (Ok, W--2251793); Smith & Reitz 10203 (Ok, W--2251662); Smith, Reitz, & Sufridini 9495 (W--2249361).

VERBENA HASTATA L., Hort. Upsal. 8 (1748); Sp. Pl., ed. 1, 20. 1753.

Synonymy: Verbena americana, urticae foliis angustioribus, flore coeruleo P. Herm., Hort. Acad. Lugd.-Bat. Cat. 699. 1687. Verbena urticae fol. angustiore flore coerul. Herm. apud Rivin., Introd. Gen. Remherb. [24], pl. [57]. 1690. Verbena americana urticae foliis angustioribus, spica multiplici flore caeruleo Herm., Fl. Lugd.-Bat. 54--55. 1690. Verbena americana urticae foliis angustioribus, spica multiplici floribus purpureis [as "Eadem floribus purpureis"] Herm., Fl. Lugd.-Bat. 55. 1690. Verbena altissima americana spica multiplici, urticae foliis angustis, floribus caeruleis Herm., Parad. Bat., ed. 1, 242. 1698. Verbena altissima americana Herm., Parad. Bat., ed. 1, pl. 242. 1698. Verbena americana urticae foliis angustioribus, flore caeruleo Moris., Pl. Hist. Univ. Oxon. 3: "408" [=410]. 1699. Verbena altissima americana, spica multiplici, urticae foliis angustis, floribus coeruleis Herm. apud Ray, Hist. Plant. 3: Suppl. 286. 1704. Verbena altissima americana spica multiplici, urticae foliis angustis, floribus coeruleis Herm., Parad. Bat., ed. 2, 242. 1705. Verbena altissima, americana Herm. apud Boerh., Ind. Plant. Hort. Acad. Lugd., ed. 1, 75. 1710. Verbena; americana; altissima; urticae foliis angustioribus; spicis brevioribus; floribus caeruleis Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186. 1720. Verbena, americana, altissima Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186, in syn. 1720. Verbena; americana; altissima; urticae foliis angustioribus; spicis brevioribus; floribus pur-

pureis Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186. 1720. *Verbena americana altissima*, *urticae foliis angustioribus*, *spicis brevibus*. *floribus caeruleis* Boerh. apud L., Hort. Cliff. 11, in syn. 1737. *Verbena foliis lanceolatis serratis*, *spicis filiformibus paniculatis* Royen, Fl. Leyd. Prod. 727. 1740. *Verbena americana altissima*, *urticae foliis angustioribus*, *spicis brevioribus*, *floribus caeruleis* Boerh. apud A. van Royen, Fl. Leyd. Prod. 327, in syn. 1740. *Verbena tetrandra*, *spicis longis acuminatis*, *foliis hastatis* L., Hort. Ups. 8. 1748. *Verbena foliis lanceolatis serratis*, *spicibus filiformibus paniculatis* Ray apud L., Hort. Ups. 8, in syn. 1748. *Verbena americana altissima*, *spica multiplici*, *urticae foliis angustis*, *floribus caeruleis* Ray apud L., Hort. Ups. 8, in syn. 1748. *Verbena americana altissima*, *urticae foliis angustis*, *spicis brevioribus*, *floribus purpureis* Boerh. apud L., Hort. Ups. 8. 1748. *Verbena americana altissima*, *spici multiplici*, *urticaefoliis angustis*, *floribus caeruleis* Herm. ex L., Sp. Pl., ed. 1, 20, in syn. 1753. *Verbena americana altissima*, *spica multiplici*, *urticae foliis angustis*, *floribus coeruleis* Ray apud J. F. Gronov., Fl. Virg., ed. 2, 4, in syn. 1762. *Verbena caule triangulo striato*, *spica nuda longissima multiplici*: *floribus saturate violaceis*....etc., etc. etc. J. F. Gronov., Fl. Virg., ed. 2, 4. 1762. *Verbena pinnatifida* Lam., Tabl. Encycl. Méth. [Illustr. Gen.] 1: 57. 1791 [not *V. pinnatifida* M. E. Jones, 1941, nor Nutt., 1941, nor Schau., 1895]. *Verbena paniculata* Lam., Encycl. Méth. Bot. 8: 548. 1808. *Verbena americana*, *altissima*, *spicâ multiplici*, *urticaefoliis angustis*, *floribus caeruleis* Herm. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena hastata*, *erecta*, *foliis lanceolatis*; *sensim angustatis*, *acutissimis*, *inciso-serratis*; *spicis paniculatis*, *linearibus subimbricatis* Michx. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena hastata*, *tetrandra*, *spicis longis*, *acuminatis*; *foliis hastatis* L. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena* (*pinnatifida*), *spicis filiformibus*; *foliis inciso-pinnatifidis*, *grosse serratis* Lam. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena spicis filiformibus*, *paniculatis*; *foliis lanceolatis*, *grosse serratis*, *indivisis* Lam. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena spicis paniculatis*, *foliis lanceolatis*, *acuminatis*, *acutè serratis*, *basi inciso-hastatis* Lam. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. *Verbena hastata* β Poir. in Lam., Encycl. Méth. Bot. 8: 546. 1808. *Verbena tetrandra*, *spicis longis acuminatis*, *fol. hastatis* L. apud H. E. Richter, Cod. Bot. Linn. 35. 1835. *Verbena fol. lanc. serratis*, *spicis filif. paniculatis* Royen apud H. E. Richter, Cod.

Bot. Linn. 35, in syn. 1835. Verbena americana altiss., spica multipl., urticae fol. angustis, fl. caeruleis Herm. apud H. E. Richter, Cod. Bot. Linn. 35, in syn. 1835. Verbena amer. urticae fol. angustiorib., fl. caeruleo Moris. apud H. E. Richter, Cod. Bot. Linn. 35, in syn. 1835. Verbena amer. altiss., urtic. f. ang., spicis breviorib., fl. purp. Boerh. apud H. E. Richter, Cod. Bot. Linn. 35, in syn. 1835. Verbena americana altiss., spica mult. etc. Herm. apud Peterm., Cod. Bot. Linn. Ind. Alph. 196, in syn. 1840. Verbena americana urticae fol. etc. Moris. apud Peterm, Cod. Bot. Linn. Ind. Alph. 196, in syn. 1840. Verbena americana altiss., urtic. fol. etc. Boerh. apud Peterm., Cod. Bot. Linn. Ind. Alph. 196, in syn. 1840. Verbena hastata Burm. apud Peterm., Cod. Bot. Linn. Ind. Alph. 196, in syn. 1840. Verbena paniculata β pinnatifida (Lam.) Schau. in A. DC., Prodr. 11: 546. 1847. Verbena hastata β pinnatifida Wood, Class-Book, ed. 41, 412. 1856. Verbena hastata var. pinnatifida (Lam.) A. Gray, Syn. Fl. N. Am. 2 (1): 336. 1878. Verbena hastata x officinalis Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894.

BOOK REVIEW

Alma L. Moldenke

"Plant Taxonomy", by Lyman Benson, 494 pp. Chronica Botanica Series, Ronald Press, New York 10, N. Y. 1962. $11.50.

Through this work Dr. Benson has made available to colleges, universities, botanical institutions, and the private scholar or hobbyist an excellently organized, advanced text and reference book.

First, it describes intimately what is involved in botanical taxonomic research; it is effectively and richly illustrated with his own fine work on the genus Ranunculus. Because this group has such a common and wide range, some species are known or easily knowable to almost any English language reader. The same is true of the genus Quercus, which is used very effectively for further illustrative purposes.

It then explains graphically how data is collected from herbarium preparation and consultation, from field observation, from microscopic morphology, from fossil analysis, from chemical and physiological experiments, from ecology, from gross and cytogenetics, and from a synthesis of observation from all of these disciplines available.

Only a very good and thoroughly experienced taxonomist and a superb teacher could have written so lucidly the sections on the principles of plant classification, the techniques of naming plants, the survey of the Code of Botanical Nomenclature, the construction and the use of keys, and the documentation of collected plant specimens.

The final section of the book deals with how materials and methods should be handled in research in this field, and how they should be presented in a treatise or monograph form, even to the details of correcting galley proof and arranging bibliographies.

The suggested reading lists at the end of the chapters, the reference list, and the index are all well chosen and amply detailed so that they are very useful. There is evidence of great skill in defining concepts and terms, none of which is marred by being didactic, unclear, too limited or too broad. The present (and future) budding generation of plant taxonomists now has this valuable, succinct guide at its disposal. Because of the terrific rate of increase in scientific knowledge, these fortunate students, including those in the related field of zoological taxonomy, can make improved use of their preparation time by studying this book.

The writer of this review would like at this time to append a note to her earlier, basically very favorable review of Dr. Benson's previous book, "Plant Classification". The dust jacket recommended this text for beginners' college biology or botany courses. I thought that it was (and is) the finest in the field at a slightly higher level or for course enrichment. I now must report that my review copy of "Plant Classification" is completely "dog-eared" because of very heavy use by two different high school students who have gained very much from it!

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NOTES ON NEW AND NOTEWORTHY PLANTS. XXXVI

Harold N. Moldenke

ALOYSIA CRENATA Moldenke, sp. nov.

Frutex; ramis crassis pluricostatis dense pubescentibus; ramulis gracilibus pluricostatis dense pubescentibus; foliis ternatis; petiolis brevissimis dense pubescentibus; laminis foliorum subcoriaceis viridibus ellipticis vel elliptico-lanceolatis vel oblanceolatis, ad apicem obtusis, ad basin acutis vel acuminatis, marginibus regulariter crenatis, supra scaberrimis rugosis, subtus dense pubescentibus; inflorescentiis axillaribus spicatis valde elongatis densissime multifloris.

Shrub; branches rather stout, not plainly tetragonal but prominently many-ridged with parallel longitudinal ribs, densely pubescent with grayish hairs; branchlets more slender, otherwise similar to the branches; principal internodes 3--4 cm. long; leaves ternate; petioles very short, 1--3 mm. long, densely grayish-pubescent; leaf-blades subcoriaceous, bright-green even in drying, elliptic to elliptic-lanceolate or else slightly oblanceolate, 3.5--9 cm. long, 1--2.5 cm. wide, obtuse at the apex, regularly crenate along the margins, acute to acuminate at the base, very scabrous and rugose above with short bulbous-based hairs, densely grayish-pubescent beneath; midrib slender, deeply impressed above, prominent beneath; secondaries slender, 5--7 per side, arcuate-ascending, deeply impressed above, prominent beneath, anastomosing near the margins; veinlet reticulation very abundant, deeply impressed above, prominulous beneath; inflorescence axillary, ternate, spicate, the spikes elongate, to 22 cm. long, very densely many-flowered, the peduncle and rachis densely grayish-pubescent; flowers sessile; bractlets subulate, 1--2 mm. long, densely grayish-pubescent, shorter than the calyx; calyx cylindric-cupuliform, 3--4 mm. long, about 1.2 mm. wide, densely grayish-pubescent, the rim shortly 5-toothed; corolla hypocrateriform, its tube 4--5 mm. long, pubescent on the outer surface, the limb about 4 mm. wide.

The type of this handsome species was collected by Karl Fiebrig (no. 6137) in the region of the Alto Paraná River, Paraguay, in 1909 or 1910, and is deposited in the United States National Herbarium at Washington.

CLERODENDRUM ERIOPHYLLOIDES Moldenke, sp. nov.

Frutex; ramis ramulisque gracilibus obtuse tetragonis densiuscule cinereo-pubescentibus; foliis decussatis vel ternatis; petiolis gracilibus densiuscule puberulis; laminis chartaceis oblongo-ovatis supra leviter subtus dense puberulis; inflorescentiis axillaribus terminalibusque cymosis multifloris laxe multibrachiatis densiuscule cinereo-pilosulis; calyce obconico densiuscule piloso, margine 5-aristato.

Shrub; branches and branchlets slender, rather densely grayish pilose with more or less antrorsely subappressed hairs, less so or glabrescent in age, obtusely tetragonal, the youngest ones sulcate; principal internodes 1--6.5 cm. long; leaf-scars large, corky, prominently elevated; leaves decussate-opposite or ternate; petioles slender, 1.4--2.4 cm. long, rather densely pilose like the branchlets; leaf-blades thin-chartaceous, oblong-ovate, 4.5--10.5 cm. long, 2.5--5.5 cm. wide, acute at the apex, entire, acuminate at the base, rather lightly short-puberulent above, more densely so beneath; midrib slender, flat above, prominulous beneath; secondaries very slender, 5 or 6 per side, arcuate-ascending, flat above, prominulous beneath; veinlet reticulation rather obscure on both surfaces; inflorescence axillary, clustered at the tips of the branchlets and appearing as though terminal, cymose, many-flowered, rather loose, not at all congested nor conglobate; peduncles very slender, 3--4 cm. long, rather densely antrorsely pilose like the branchlets; individual cymes many times dichotomous, pilose like the peduncles; calyx obconic, its tube about 2 mm. long, the rim 5-aristate, the tube and teeth rather densely pilose; corolla hypocrateriform, its tube very slender, about 9 mm. long, the limb about 6 mm. wide.

The type of this species was collected by Mrs. Helen G. Faulkner (no. 2785) in coastal bush, shade or semi-shade, at Chukwani, Zanzibar, at sea-level, on March 21, 1961, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

LANTANA VENTURI Moldenke, sp. nov.

Frutex; ramulis gracilibus minute puberulis vel glabrescentibus subtetragonis; foliis oppositis; petiolis gracilibus brevibus minute strigillosis; laminis foliorum membranaceis olivaceis ovatis, ad apicem subacutis vel obtusis, ad basin abrupte acutis, margine regulariter serratis, utrinque parce strigillosis vel pilosulis; inflorescentiis axillaribus capitatis; pedunculis gracilibus parce pilosulis; capitulis parvis multifloris densis.

Shrub; branchlets and twigs slender or very slender, subtetragonal, minutely puberulent or glabrescent in age, grayish or stramineous; nodes annulate; principal internodes 2--3 cm. long; leaves decussate-opposite; petioles slender, abbreviated, 2--5 mm. long, minutely strigillose; leaf-blades membranous, olive-green even in drying, somewhat lighter beneath, ovate or the younger ones elliptic-ovate, 2.5--5 cm. long, 1.4--2.8 cm. wide, subacute or obtuse at the apex, abruptly acute at the base, regularly serrulate from the widest part to the apex, sparsely strigillose or pilosulous on both surfaces; midrib very slender; secondaries 5 or 6 per side, very slender, ascending, not much arcuate, terminating in the sinuses between the marginal teeth, flat or practically so on both surfaces like the midrib; veinlet reticulation very fine, almost indiscernible on both surfaces; inflorescence axillary, capitate; peduncles very slender, 2.5--3 cm. long, sparsely pilosulous; heads small, hemispheric, to 1 cm. long and wide, densely many-flowered; lower bractlets enlarged, lanceolate, to 7 mm. long and 2 mm. wide, attenuate-acute at the apex, sparsely pilosulous, subequaling the corollas; corolla hypocrateriform, rose-color.

The type of this species was collected by Santiago Venturi (no. 7339) -- in whose honor it is named -- among rocks in a quebrada at Tilcara, dept. Tilcara, at an altitude of 3000 meters, Jujuy, Argentina, on February 1[illegible], 1927, and is deposited in the United States National Herbarium at Washington.

VERBENA RADICATA Moldenke, nom. nov.

Verbena radicans Gill. & Hook. in Hook., Bot. Misc. 1: 170. 1829 [not V. radicans Moench, Meth. 369. 1794].

VERBENA RADICATA var. GLABRA (Hicken) Moldenke, comb. nov.

Verbena radicans var. glabra Hicken, Darwiniana 1: 66. 1923.

Figure 9. Distribution of *Verbena halei* in the United States

Mapping by counties done by Andrew R. Moldenke

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TAXONOMIC PROBLEMS OF CRATAEGUS, WITH SPECIAL REFERENCE TO SPECIES OF HYBRID ORIGIN

Kendall Laughlin
165 Pine Ave., Chicago, Ill.

Since there seems to be much misunderstanding about Crataegus among uninformed persons, particularly in the East, I submit the following statements and conclusions regarding the Hawthorns of Cook and Du Page Counties of Illinois:

1. There are at least 26 readily identified species and 5 varieties in addition to the types.

2. The individuals of each species vary within a certain range. Variations in a population of hybrid origin are more restricted.

3. There is no gradation between species.

4. Knowledge of 79 characters is desirable to identify a plant.

5. Some characters are more important than others. The diagnostic importance of various characters varies from series to series, as shown in a Key.

6. Most Hawthorns found in the field are so distinctive that they can be identified with reasonable certainty by their leaves, bark, thorns and manner of growth without recourse to floral characters.

7. Nearly one-third of all the described species are of hybrid origin.

8. Individual undescribed F_1 hybrids are quite rare, but a number have been found.

9. The taxonomy of species of hybrid origin is no different from pure species except for the problem of deciding what series to place them into where the parents belonged to different series.

10. It is as necessary to describe species of hybrid origin as it is to describe pure species and a taxonomic treatment of the genus that disposes of species of hybrid origin by a mere mention of the parents is vitiated.

11. The characters of the parents may be combined in any one of many different ways in a hybrid. Hybrid populations from the same parents may be so different (as acanthacolonensis and disperma) that they are assigned to different series. All the members of each hybrid population have identical characters, such as the color of the anthers, since they descended from a common ancestor. I know of no hybrid-swarms in Crataegus and no evidence that this genus conforms to Mendel's law.

12. An inbred hybrid population of great age may have developed characters different from and not

intermediate between the parents. A. E. Longley's "Cytological Studies in the Genus *Crataegus*" published in The American Journal of Botany *11*:295-317; 1924 showed that *C. hillii* is of hybrid origin, a hypothesis morphologically verified by the odd number of its stamens. Its parents were the Downy Hawthorn *mollis* and the Scarlet Hawthorn *pedicellata*. But the nutlets of *hillii* are 9 mm. long, thin, and acute at both ends, a combination of characters not found in either parent or in any other species of its region.

13. On the assumption that "classical" taxonomy is the proper base, adequate treatment of *Crataegus* requires detailed descriptions of all species and varieties, regardless of their phylogeny.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XXXVII

Harold N. Moldenke

DURANTA DOMBEYANA var. ESPINOSAE Moldenke, var. nov.

Haec varietas a forma typica speciei calicibus sub anthesin 10—12 mm. longis recedit.

This variety differs from the typical form of the species in having its calyxes at time of anthesis 10—12 mm. long.

The type of the variety was collected by my friend and colleague, Dr. Reinaldo Espinosa (1899—1950), *no. E.1805* — in whose honor it is named — at Zaruma (alturas de Viscaya), at an altitude of 1530 meters, El Oro, Ecuador, on August 18, 1947, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector, whose untimely death on a botanical excursion was a great loss to South American botanical science, notes "Arbusto de ramas duras y largas. Hojas color verde claro. Corola color lila muy claro. Frecuente."

LANTANA CUJABENSIS var. PARVIFOLIA Moldenke, var. nov.

Haec varietas a forma typica speciei laminis foliorum lanceolatis 2.3—4.5 cm. longis 1—2.1 cm. latis recedit.

This variety differs from the typical form of the species in having its leaf-blades lanceolate, 2.3—4.5 cm. long, and 1—2.1 cm. wide.

The type of the variety was collected by N. Angulo and H. Arnaldo López Miranda (*no. 1346*) at Jalca, at an altitude of 3360 meters, Jalca de Ullancán, province of Utuzco, La Libertad, Peru, on July 1, 1951, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York.

LANTANA TRIFOLIA f. RUBIERENSIS Moldenke, f. nov.

Haec forma a forma typica speciei recedit laminis foliorum argute acuminatis et marginibus grosse crenatis.

This form differs from the typical form of the species in having its leaves sharply acuminate at the apex and the margins coarsely crenate.

The type of this form was collected by Mayeul Grisoll (no. 15) at La Rubiera, near Calabozo, Guárico, Venezuela, and is deposited in the United States National Herbarium at Washington.

LIPPIA LOPEZII Moldenke, sp. nov.

Arbuscula ramosa; ramis gracilibus obtuse tetragonis sulcatisque minute puberulis; ramulis pergracilibus puberulis; foliis oppositis parvis, laminis 6—10 mm. longis 3—4 mm. latis obovatis obtusis vel subacutis, ad apicem parcidenticulatis, utrinque minute albido-strigillosis; inflorescentiis axillaribus oppositis subsessilibus capitatis multifloris cinereis.

Small shrub, apparently considerably branched; branches slender, brownish, obtusely tetragonal and margined, striate-sulcate between the angles, minutely puberulent; branchlets very slender, tetragonal, margined, puberulent; principal internodes rather uniformly 1—1.5 cm. long; leaves decussate-opposite, sometimes somewhat fasciculate, sessile or subsessile, thick-textured, obovate, 6—10 mm. long, 3—4 mm. wide, obtuse or subacute and sparsely denticulate at the apex, rather cuneately narrowed and entire to the base, minutely white-strigillose on both surfaces, rather more densely so beneath; midrib usually impressed above and prominulent beneath, the remainder of the venation obscure; inflorescence axillary, opposite, sessile or subsessile, capitate, many-flowered, grayish-puberulent throughout; corolla hypocrateriform, about 5 mm. long, white, densely white-strigose outside.

The type of this species was collected by H. Arnaldo López Miranda and A. Sagástegui A. (no. 3426) on a dry rocky slope between Huaylillas and Tayabamba, province of Pataz, La Libertad, Peru, at an altitude of 2350 meters, on May 21, 1961, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York.

PAEPALANTHUS DICHOTOMUS var. GLABRESCENS Moldenke, var. nov.

Haec varietas a forma typica speciei foliis extra basin glabris nitidisque recedit.

This variety differs from the typical form of the species in having its leaves, except for the very base, completely glabrous and shiny.

The type of the variety was collected by John J. Wurdack (no. 1388), locally frequent, in clumps, in the Jalca zone 1—5 km. west of Molinopampa, at an altitude of 2400—2450 meters, province of Chachapoyas, Amazonas, Peru, on July 18, 1962, and is deposited in the United States National Herbarium at Washington.

PAEPALANTHUS WURDACKI Moldenke, sp. nov.

Herba perennis; caule lignoso elongato dense folioso; foliis

oblongo-linearibus usque ad 1 cm. longis ad apicem subobtusis vel acutis supra dense adpresso-pilosis, pilis albis antrorsis, subtus glabris; pedunculis terminalibus solitariis, 3.5--5.5 cm. longis pergracillimis tortis dense adpresso-pilosis, pilis albis antrorsis; vaginis arcte adpressis 1 cm. longis dense albo-pilosis, pilis adpressis antrorsis, ad apicem densissime albo-barbatis; capitulis solitariis hemisphaericis vel subglobosis ca. 5 mm. latis albis; bracteolis involucris oblanceolatis bruneis 1.5--2 mm. longis 0.5 mm. latis ciliolatis.

Perennial herb, forming dense mats; stems numerous, branched, apparently 5 cm. long or longer, woody, densely leafy toward the apex; leaves numerous, oblong-linear, very pronouncedly gray-green in appearance, to 1 cm. long, about 1 mm. wide, subobtuse or acute at the apex, opaque, not fenestrate, densely appressed-pilose with white antrorse hairs above, glabrous and shiny beneath, long-ciliate on the margins, barbulate at the apex; peduncles terminal on each stem, solitary, far surpassing the leaves, 3.5--5.5 cm. long, very slender, twisted, densely appressed-pilose with white antrorse hairs; sheath narrow, closely appressed, about 1 cm. long, densely white-pilose with appressed antrorse hairs, very conspicuously and densely long-barbate at the apex; heads solitary, simple, hemispheric or later subglobose, white, about 5 mm. wide, densely many-flowered; involucral bractlets oblanceolate, brown, shiny, 1.5--2 mm. long, about 0.5 mm. wide, rather obtuse at the apex, glabrous except for the ciliolate margins.

The type of this distinctive species was collected by John J. Wurdack (no. 1081) -- in whose honor it is named -- locally abundant, in clumps, in the Jalca zone along the Yambrashbamba--Pomacocha trail between Yanayacu and Pomacocha, at an altitude of 2300--2400 meters, province of Bongará, Amazonas, Peru, on June 26, 1962, and is deposited in the United States National Herbarium at Washington.

VERBENA PUMILA f. ALBIDA Moldenke, f. nov.

Haec forma a forma typica speciei corollis albis recedit.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Robert Runyon (no. 2499) in sandy loam, open sandy ground, at the edge of Kenedy County along Highway 96 at the Willacy County line, at an altitude of 10 meters, Texas, on April 18, 1941, and is deposited in the Britton Herbarium at the New York Botanical Garden. This brings to 31 the described white-flowered forms of otherwise differently colored species of this genus. White mutations have been described also in Caryopteris (1), Clerodendrum (4), Cornutia (1), Duranta (1), Lantana (14), Petrea (3), Phyla (1), Stachytarpheta (4), and Vitex (6). Four white-fruited forms have been described in Callicarpa and one in Lantana. Unquestionably more will be discovered as our knowledge of these and other verbenaceous genera improves and collectors' field notes become more complete.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS *VERBENA*. XII

Harold N. Moldenke

VERBENA L.

Additional & emended bibliography: Tragus, Stirp. Germ. 210 & 211. 1552; Dodon., Stirp. Hist. Pemptad., ed. 1, 149—151. 1583; Gesner, Stirp. Collect. 113. 1587; L'Obel, Icon. Stirp. 534—535. 1591; Gerarde, Herbal 580—582, fig. 1 & 2. 1597; Clus., Rar. Plant. Hist. Stirp. 2 ["4"]: xlv—xlvi. 1601; Dodon., Stirp. Hist. Pemptad., ed. 2, 149—151. 1616; Kniphof, Orig. Cent. 12: no. 98 & 99. 1764; Kniphof, Herb. Viv. 2: 1155—1158. 1764; Poir. in Lam., Encycl. Méth. Bot. [Illustr. Gen.] 1: 57, pl. 17, fig. 1 & 2. 1791; Vahl, Enum. Pl. 1: 207—208. 1804; Raf., Med. Repos., ser. 2, 5: 352 & 360. 1808; Raf., Journ. Bot. (Paris) 2: 170. 1808; Raf., Journ. Bot. (Paris) 1: 228. 1809; Sims in Curtis, Bot. Mag. 45: pl. 1976. 1818; Raf., First Cat. Bot. Gard. Transylv. Univ. 16. 1824; Torr., Ann. Lyc. Nat. Hist. N. Y. 2: 234. 1827; Lehm., Nov. & Minus Cog. Stirp. Pug. 1: 37. 1828; Lehm., Nov. Act. Acad. Caes. Leopold. 14: 824. 1828; Raf., Atl. Journ. 1: 146 & 154. 1832; Reider, Ann. Blumisterei 8: [pl. 12]. 1832; Raf., Herb. Raf. 50, 61, 65, & 69. 1833; Jacq., Annal. Flore & Pomme 1836: 56-57, pl. 8. 1836; Ascherson in G. Schweinf., Beitr. Fl. Aethiop. 120 & 278. 1867; R. A. Phil., Anal. Univ. Chile 35: 190—192. 1870; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 1, 86, 87, 107, 150, 165, 167, & app. iv. 1878; Batt. & Trab., Fl. Alg. 1: 716—717. 1888; Hook. f. & Jacks., Ind. Kew. 2: 895, 1161, 1178—1180, & 1248. 1895; N. L. Britton, Man. 778. 1900; Fiori & Paoletti, Icon. Fl. Ital. 2: 380, fig. 3219. 1902; Dusén, Arch. Mus. Nac. Rio Jan. 13: 36 & 94. 1903; Schaffner, Ohio Nat. 7: 31—34. 1906; Blewitt, Rhodora 13: 89. 1911; Gerth van Wijk, Dict. Plantnames 1: 1398 (1911) and 2: 228, 478, 655, 893, & 1492. 1916; J. H. Schaffner, Ohio Journ. Sci. 21: 133. 1921; R. E. Arnold, Gard. Chron., ser. 3, 76: 245. 1924; S. Arnott, Gard. Chron., ser. 3, 76: 267. 1924; "C.", Gard. Chron., ser. 3, 76: 279, fig. 99. 1924; Trivetts, Cat. 1932; Wadmond, Rhodora 34: 19. 1932; Trivetts, Cat. Suppl. 1933 Novelty List 6. 1933; Truman, Rhodora 40: 244—245. 1938; N. F. Petersen, Amer. Bot. 45: 166—167. 1939; Monod, Phanerogames in Contrib. Etude Sahara Occident. 2: pl. 22. 1939; Off. Org. Malayan Agr.-Hort. Assoc. Kuala Lumpur 10: 152. 1940; H. E. Stone, Fl. Chester Co. 1123—1126 & 1470. 1945; Tryon & Moore, Rhodora 48: 115, 116, & xiv. 1946; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 55: 56. 1946; E. D. Merr., Ind. Raf. 205 & 295. 1949; C. Skottsberg, Medd. Göt. Bot. Trädg. 18: 151. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 50—70. 1951; H. C. Greene, Am. Midl. Nat. 48: 52. 1952; H. C. Greene, Biol. Abstr. 27: 1885. 1953; Biol. Abstr. 27: 3735 & 3768. 1953 [not "1955"]; Peter Pauper Press, Little Limerick Book 56. 1955; Hocking, Dict. Terms Pharmacog. 240 & 284. 1955; Martínez Crovetto & Rojo, Revist. Invest. Agric. 11: 129. 1957; Mattoon, Pl. Buyers Guide, ed. 6, 287--288. 1958; Lundell, Wrightia 2: 47. 1960; P. Jaeger, Wonderf. Life of Fls. 124. 1961; Zohary, Pl. Life Palest. 164. 1962; Soukup, Biota 4: 191. 1962; Angely, Fl. Bacia Paran. 22: 39. 1962; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3--4. 1962; Moldenke, Résumé Suppl. 6: 1--11. 1963; Vaughan's Gard. Illustr. 87:45, 57, & 67. 1963; Gleason & Cronquist, Man. Vasc. Pl. li, 579--581, 807, & 808. 1963; Park's Flower Book 1963: 39, fig. 2043, 2058, & 2060. 1963; Pelletized Seed Co., seed packet P.4370. 1963; Raven, Aliso 5: 299, 336, & 392. 1963; Haggerty, Our Parks 29 (1): 1. 1963; B.A.S.I.C. 43 (2): B.112 (1963) & 43 (4): B.110. 1963; Assoc. Etude Taxon. Fl. d'Afr. Trop. Index 1962: 63. 1963; Coon, Using Pl. for Heal. 220. 1963.

Additional excluded species:

Verbena alba in locis umbrosis, flor. Iul. Gesn. -- in the Lamiaceae

Verbena altera fuchsii Gesn. -- in the Lamiaceae

Verbena, floret August. & Sept. semen fert. Octob. Gesn. -- in the Lamiaceae

Verbena foemina seu supina fuchsii Gesn. -- in the Lamiaceae

Verbena lutea fuchsii Gesn. -- in the Lamiaceae

Verbena quaedam rarior (è provincia) pulchrior & maioribus floribus, si benè me mini, floret Iul. Gesn. -- in the Lamiaceae

Soukup (1962) refers to this genus as "China verbena", but in all probability it is merely xV. hybrida Voss to which he is here referring.

The Collector undesignated s.n. [ex Chili] distributed as Verbena sp. in the Lund herbarium is actually Phyla nodiflora var. rosea (D. Don) Moldenke, Oemler s.n. [1837] is Persicaria hirsuta (Walt.) Small in the Polygonaceae, and D. S. Correll 26588 is not verbenaceous.

Nair & Rehman (1962) give an interesting "key" for the identification of five species of this genus by their pollen-grains:

1. Ectine surface granulate.
  2. Endocolpium faint......................V. phlogiflora Cham.
  2. Endocolpium clear (lalongate).............V. bonariensis L.
    3. Longest diameter of endocolpium 12--16.8 μ...............V. officinalis L.
    3a. Longest diameter of endocolpium below 10 μ...............V. rigida Spreng.
1a. Ectine surface psilate.....................“V. pinnatifida”.

Since they later state that the endocolpium of V. bonariensis is "5.6 x 16.8 μ", it is not clear how they expect the above "key" to be used. To what they are referring by "V. pinnatifida" is also not clear -- perhaps to V. tenuisecta Briq.

Full explanation of the abbreviations and symbols used for the names of the 269 herbaria in which Verbena material herein cited is deposited is given in PHYTOLOGIA 5: 154—159 (1955), 6: 242 (1958), 7: 91—92 (1959), 7: 123—124 (1960), 7: 343 (1961), and 8: 95 (1961), with the following additions: Ag = Carlos Muños Herbarium, Ministerio de Agricultura, Santiago, Chile; Am = Southwest Research Station, American Museum of Natural History, Portal, Arizona; Hi = University of North Carolina, Chapel Hill, North Carolina; Hr = H. Hürlimann Herbarium, CIBA, Basel, Switzerland; Jz = J. de J. Jiménez Herbarium, Santiago de los Caballeros, Dominican Republic; Og = P. Olrog Herbarium; Pm = Pharma Herbarium, CIBA, Basel, Switzerland; Rf = Texas Research Foundation, Renner, Texas; Ul = Centro de Botanica, Junta de Investigações de Ultramar, Lisbon, Portugal; and Ws = University of Wisconsin, Madison, Wisconsin.

VERBENA ABRAMSI Moldenke

Additional bibliography: Moldenke, Phytologia 8: 378 & 396 (1962) and 8: 460. 1963; Moldenke, Résumé Suppl. 6: 3. 1963.

Howell reports the stems prostrate and rooting, the inflorescences ascending.

Additional citations: CALIFORNIA: Monterey Co.: J. T. Howell 40039 (Z).

VERBENA ALATA Sweet

Additional bibliography: Moldenke, Phytologia 8: 146—148 (1961), 8: 379 & 397 (1962), and 8: 460. 1963.

The Sellow specimen represented by Macbride's photograph 17399 was in the Berlin herbarium before World War II and is now destroyed.

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Macbride photos 17399] (N—photo). URUGUAY: Collector undesignated s.n. [Monte Video] (Lu).

VERBENA AMBROSIFOLIA Rydb.

Additional bibliography: Moldenke, Phytologia 8: 379 & 397—399 (1962) and 8: 460—461. 1963; Moldenke, Résumé Suppl. 6: 3, 4, 8, & 10. 1963.

Additional citations: TEXAS: Jeff Davis Co.: A. R. Moldenke 648 (S). Pecos Co.: A. R. Moldenke 649 (S), 650 (S). NEW MEXICO: Lincoln Co.: A. R. Moldenke 637 (S), 638 (S). Otero Co.: A. R. Moldenke 640 (S), 642 (S); Moldenke & Woods 606 (S), 608 (S).

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry

Additional bibliography: Moldenke, Phytologia 8: 379 & 399—400. 1962; Moldenke, Résumé Suppl. 6: 3. 1963.

Additional citations: NEW MEXICO: Hidalgo Co.: A. R. Moldenke 780 (S). Luna Co.: A. R. Moldenke 630 (S). ARIZONA: Cochise Co.: A. R. Moldenke 782 (S), 784 (S); Moldenke & Woods 611 (S), 613 (S).

VERBENA ARAUCANA R. A. Phil.

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 50. 1951; Moldenke, Phytologia 8: 379. 1962.

VERBENA ARISTIGERA S. Moore

Additional bibliography: Moldenke, Phytologia 8: 189—191 & 400 (1962) and 8: 461. 1963; Moldenke, Résumé Suppl. 6: 7 & 8. 1963.

The Moore specimen represented by Macbride's photograph 17403 was in the Berlin herbarium before World War II, but is now destroyed.

Additional citations: BRAZIL: Matto Grosso: *S. Moore 1083* [Macbride photos 17403] (N--photo of type).

VERBENA ATACAMENSIS Reiche

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 51. 1951; Moldenke, Phytologia 8: 379 & 400. 1962.

VERBENA BALANSAE Briq.

Additional citations: BRAZIL: Santa Catarina: Reitz C.883 (N).

VERBENA BARBATA Grah.

Additional bibliography: Moldenke, Phytologia 8: 201. 1962; Moldenke, Résumé Suppl. 6: 10. 1963.

VERBENA BERTERII (Meisn.) Schau.

Emended synonymy: *Shuttleworthia berterii* Meisn., Pl. Vasc. Gen. 2: 198. 1839.

Additional & emended bibliography: Hook. f. & Jacks., Ind. Kew. 2: 895 & 1178. 1895; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 51—52. 1951; Moldenke, Phytologia 8: 380—381 & 401 (1962) and 8: 461—462. 1963.

Material of this species has been misidentified and distributed in herbaria as *V. radicans* Gill. & Hook. On the other hand, the *Skottsberg & Skottsberg 843* cited by me in Phytologia 8: 205 is actually *V. sulphurea* D. Don, as is also the *Bridges s.n.* [Chile] distributed as "*V. erinoides* Hook."

Additional citations: CULTIVATED: Sweden: *Collector undesignated s.n.* [H. H. Loc. 1837] (Lu).

VERBENA BIPINNATIFIDA Nutt.

Additional synonymy: *Verbenia bipinitifida* Walker, in herb.

Additional bibliography: Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Phytologia 8: 230—242, 381, & 401—404 (1962) and 8: 462. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579 & 581. 1963; Moldenke, Résumé Suppl. 6: 3 & 10. 1963; Park's Flower Book 1963: 39. 1963.

The species is described by Park (1963) as "a showy 15 inch everblooming perennial in lavender-blue with lovely fern-like foliage" and is sold by him at the rate of 100 seeds for 25 cents; 200 for 45 cents. Seeds are also available to the horticultural trade from Thompson & Morgan (England), Vaughan's (New York & Chicago), American Perennial Gardens (Garden City, Mich.), Pearce (Moorestown, N. J.), and Saier (Dimondale, Mich.). An additional common name is "fern verbena". Gould describes the corollas as light-violet and found the plant in disturbed black rocky soil; Gould & Hycka found it in open oak-mesquite woods; Warnock describes the species as "infrequent and widespread" in Val Verde County, Texas; Powell & Edmondson refer to it as "infrequent" on prairies in Durango.

The F. W. Pond 27, distributed as V. bipinnatifida, is actually V. canadensis (L.) Britton; Fleetwood 3444 is V. ciliata var. longidentata Perry; Hayes 610 is V. pumila Rydb.; and C. Jackson 184 is V. tenuisecta Briq.

Additional citations: KANSAS: Smith Co.: W. H. Horr E.108 (Au—121735). ARKANSAS: Hempstead Co.: Demaree 44963 (S). OKLAHOMA: Choctaw Co.: Nelson, Nelson, & Goodman 5534 (Au—121733). Major Co.: Waterfall & Coryell 9921 (Au—121736). Murray Co.: Muncrief 72 (Au—121734). TEXAS: Bell Co.: Moldenke & Woods 583 (S). Bosque Co.: A. R. Moldenke 663 (S). Comanche Co.: A. R. Moldenke 659 (S); Moldenke & Woods 594 (S). Coryell Co.: Moldenke & Woods 588 (S). Dallas Co.: Lundell & Lundell 11315 (Au—198825, Ld). Ellis Co.: Moldenke & Woods 575 (S). Erath Co.: A. R. Moldenke 660 (S). Falls Co.: Moldenke & Woods 590 (S). Garza Co.: Moldenke & Woods 604 (S). Hartley Co.: York & Rodgers 336 (Au—201856). Hays Co.: J. W. Walker 42 (Au—197613). Hill Co.: Moldenke & Woods 568 (S). Jones Co.: N. C. Henderson 63-135 (Au). Kent Co.: Moldenke & Woods 605 (S). Lampasas Co.: Moldenke & Woods 592 (S). Lynn Co.: Moldenke & Woods 577 (S), 597 (S), 601 (S), 602 (S). McLennan Co.: Moldenke & Woods 579 (S). Menard Co.: A. R. Moldenke 656 (S). Oldham Co.: York & Rodgers 401 (Au—200967). Reagan Co.: A. R. Moldenke 653 (S). San Patricio Co.: Gould & Hycka 8042 (Au—194231). Schleicher Co.: A. R. Moldenke 654 (S). Shackleford Co.: N. C. Henderson 63-95 (Au—217645). Terry Co.: Moldenke & Woods 603 (S). Throckmorton Co.: F. W. Gould 9080 (Au—191040). Upton Co.: A. R. Moldenke 652 (S). Val Verde Co.: B. H. Warnock 11349 (Au—198457). ARIZONA: Cochise Co.: A. R. Moldenke 783 (S); Moldenke & Woods 612 (S). MEXICO: Coahuila: E. G. Marsh 1121 (Au—212919). Durango: Powell & Edmondson 961 (Au—193236).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry

Additional bibliography: Moldenke, Phytologia 8: 381 & 404—405 (1962) and 8: 462. 1963.

Additional citations: ARIZONA: Cochise Co.: Moldenke & Woods 610 (S), 614 (S), 615 (S). Santa Cruz Co.: A. R. Moldenke 622 (S). MEXICO: Michoacán: Hinton 13125 (Rf).

xVERBENA BLANCHARDI Moldenke

Additional bibliography: Moldenke, Phytologia 8: 381—382 & 405 (1962) and 8: 462. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963.

VERBENA BONARIENSIS L.

Additional & emended bibliography: Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 197. 1893; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3—5, fig. 2. 1962; Maria, Pl. Vall. Coch. 38. 1962; Moldenke, Phytologia 8: 382—383 & 405—407 (1962) and 8: 463. 1963; Vaughan's Gard. Illustr. 87: 67. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963; Moldenke, Résumé Suppl. 6: 6—8 & 10. 1963.

Additional illustrations: Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3, fig. 2. 1962.

Nair & Rehman (1962) describe the pollen-grains of this species as follows: "size 43 μ (range 39—46 μ). Endocolpium lalongate (5.6 x 16.8 μ)" and cite Nat. Bot. Gard. 24619 from Almora (slide 2727), not as yet seen by me.

Vaughan (1963) offers this species to the horticultural trade as seed packet 8566A and describe it as "Tall, hardy verbena. Perennial.....4 ft. Sweet scented rosy lavender flowers on long stiff stems. Will flower first year from a March sowing. Start seed indoors and set small plants out when ground is sufficiently warm", selling it at 15 cents per packet.

Curtiss 1963 is a mixture — the part [1963*] from "sandy ridges bordering the ocean, eastern Florida" is V. maritima Small; the part [1963**] from "roadsides near Charleston" is V. bonariensis L.; and the part [1963] from "low open woods, Indian River, June" is V. tampensis Nash.

Maria (1962) cites his no. 182/4e from Cochabamba, Bolivia, not as yet seen by me.

The Dusén 14320 and Gould & Reeves 8227, distributed as V. bonariensis, are actually V. brasiliensis Vell., while O. Solís 70 is V. sphaerocarpa Perry.

Seeds of V. bonariensis are offered to the horticultural trade by Vaughan's (New York & Chicago), Burnett Brothers (New York), Roberts (Davington, Kent), Sutton & Sons (Reading), Thompson & Morgan (England), Watkins & Simpson (London), Homestead Nurseries (Boskoop), Hillier & Sons (Winchester), Pearce (Moorestown, N. J.), Saier (Dimondale, Mich.), and John Forbes (Hawick).

Additional citations: ALABAMA: Winston Co.: A. R. Moldenke 771 (S). MISSISSIPPI: Holmes Co.: A. R. Moldenke 754 (S). Jefferson Co.: A. R. Moldenke 740 (S). LOUISIANA: Beauregard Par.: A. R. Moldenke 709 (S). Bienville Par.: A. R. Moldenke 685 (S). Natchitoches Par.: A. R. Moldenke 698 (S). ARGENTINA: Buenos Aires: Collector undesignated s.n. [Buebos Ayres] (Lu). San Juan: Cuezzo 1077 (Rf). Tucumán: Bruch 2723 (N). CHILE: Valdivia: Hollermayer s.n. [Werdermann 1362] (N). TANGANYIKA: Faulkner 2231 (S). SOUTHERN RHODESIA: Fries, Norlindh, & Weimarck 2655 (Lu), 2847 (Lu), 4003 (Lu). CULTIVATED: England: Stearn s.n. [Moldenke & Moldenke 9160] (N).

VERBENA BRACTEATA Lag. & Rodr.

Additional synonymy: *Verbena brevibracteata* Eggert ex Prain, Ind. Kew. Suppl. 3: 187. 1908; Perry, Ann. Mo. Bot. Gard. 20: 338, in syn. 1933. *Verbena bracteatum* Lag. & Rodr., in herb.

Additional bibliography: Perry, Ann. Mo. Bot. Gard. 20: 342. 1933; Moldenke, Phytologia 8: 274—309, 383—384, & 407—412, fig. 5 (1962) and 8: 464. 1963; Moldenke, Résumé Suppl. 6: 1—3, 8, & 10. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579—581. 1963.

Perry (1933) regarded Eggert's *V. brevibracteata* as a synonym of *V. pumila* Rydb. because the specimens he so identified are that species. He based his binomial, however, on Gray's *V. bracteata* var. *brevibracteata* and therefore his name has to go into the same synonymy as Gray's trinomial.

Cronquist found *V. bracteata* "on lake shore above present water level but well below highwater mark" in Oregon. Demaree reports it as "common" on low sandy ridges in Arizona. Rowell describes the corollas as "pale-purple" and found the plant in deep sand of dunes "locally abundant in disturbed area around prairie dog town". It has also been found in sandy soil, sandy loam, and on rolling prairies. Warnock calls it a "frequent annual prostrate in limestone depressions"; Wiggins & Wiggins found it growing with *Xanthium* and *Distichlis* "on soil flooded when reservoir is full"; Rowell states that it is "occasional" in sandy loam or tight sandy loam near cattle tanks.

The *Correll & Johnston 21530* distributed as *V. bracteata* is actually *V. gracilis* Desf., while *Waterfall 12703* is *V. subuligera* Greene

Additional citations: ALABAMA: Lawrence Co.: *A. R. Moldenke 768* (S). ARKANSAS: Desha Co.: *Demaree 45863* (S). COLORADO: Archuleta Co.: *C. F. Baker 564* (Lu). Boulder Co.: *Ewan, Pl. Exsicc. Gray. 1090* (Au—19864, Rf). TEXAS: Carson Co.: *H. N. Moldenke 21883* (S). Culberson Co.: *B. H. Warnock 14313* (Au—198201). Dallam Co.: *C. M. Rowell 5384a* (Au—195968), *5401a* (Au—195986); *Turner & Melchert 4800* (Au—209801); *York & Rodgers 165* (Au—201685), *205* (Au—201744), *242* (Au—201831). Hemphill Co.: *C. M. Rowell 4037* (Au—195200). Lipscomb Co.: *C. S. Wallis 7240* (Au—210257). Lubbock Co.: *C. M. Rowell 60-024* (Au—195352). Oldham Co.: *H. N. Moldenke 21884* (S). NEW MEXICO: Catron Co.: *A. R. Moldenke 628* (S). Otero Co.: *A. R. Moldenke 641* (S). Sierra Co.: *A. R. Moldenke 633* (S). Socorro Co.: *A. R. Moldenke 634* (S). ARIZONA: Apache Co.: *Demaree 44626* (S). Coconino Co.: *Demaree 42147* (S). OREGON: Harney Co.: *Cronquist 8570* (Au—207619, Mi, N). CALIFORNIA: Lassen Co.: *Wiggins & Wiggins 16338* (Au—200548).

VERBENA BRASILIENSIS Vell.

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 52. 1951; Moldenke, Phytologia 8: 309—323, 384, & 412—414, fig. 6 (1962) and 8: 464—465. 1963; Moldenke, Résumé Suppl. 6: 2 & 6. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579. 1963.

Balls found this species in a cultivated field in California in association with Typha, Juncus, etc. Gould & Reeves found it on "open coastal prairie" in Chambers County, Texas, while Demaree reports it as "very common all along the coast" in Harrison County, Mississippi.

The specimen of Lorentz 131 which is represented by Macbride's photograph 20316 is deposited in the Munich herbarium.

Additional citations: ALABAMA: Etowah Co.: Moldenke & Woods 503 (S). Lawrence Co.: A. R. Moldenke 769 (S). Winston Co.: A. R. Moldenke 770 (S); Moldenke & Woods 505 (S). MISSISSIPPI: Adams Co.: A. R. Moldenke 735 (A). Attala Co.: A. R. Moldenke 755 (S). Choctaw Co.: A. R. Moldenke 760 (S). Claiborne Co.: A. R. Moldenke 742 (S); Moldenke & Woods 518 (S). Clay Co.: A. R. Moldenke 764 (S). Copiah Co.: Moldenke & Woods 519 (S). Harrison Co.: Demaree 29009 (Au—121835). Hinds Co.: Moldenke & Woods 520 (S). Holmes Co.: A. R. Moldenke 753 (S). Humphreys Co.: A. R. Moldenke 749 (S); Moldenke & Woods 514 (S). Issaquena Co.: A. R. Moldenke 748 (S). Itawamba Co.: Moldenke & Woods 509 (S). Jefferson Co.: A. R. Moldenke 737 (S); Moldenke & Woods 517 (S). Lee Co.: Moldenke & Woods 512 (S). Lowndes Co.: A. R. Moldenke 762 (S). Noxubee Co.: A. R. Moldenke 758 (S). Panola Co.: Moldenke & Woods 521 (S). Sharkey Co.: A. R. Moldenke 751 (S); Moldenke & Woods 515 (S). Warren Co.: A. R. Moldenke 747 (S); Moldenke & Woods 522 (S). Winston Co.: A. R. Moldenke 759 (S). Yazoo Co.: Moldenke & Woods 513 (S). ARKANSAS: Desha Co.: Demaree 45861 (S). LOUISIANA: Allen Par.: A. R. Moldenke 712 (S). Avoyelles Par.: A. R. Moldenke 721 (S). Beauregard Par.: A. R. Moldenke 706 (S). Bienville Par.: A. R. Moldenke 686 (S). Bossier Par.: A. R. Moldenke 677 (S); Moldenke & Woods 550 (S). Caddo Par.: Moldenke & Woods 552 (S). Caldwell Par.: Moldenke & Woods 534 (S). Catahoula Par.: A. R. Moldenke 732 (S). Concordia Par.: A. R. Moldenke 736 (S). DeSoto Par.: A. R. Moldenke 694 (S). Evangeline Par.: A. R. Moldenke 714 (S). Franklin Par.: Moldenke & Woods 529 (S). Grant Par.: A. R. Moldenke 730 (S). Jackson Par.: Moldenke & Woods 533 (S). LaSalle Par.: A. R. Moldenke 729 (S). Lincoln Par.: Moldenke & Woods 537 (S). Natchitoches Par.: A. R. Moldenke 700 (S). Pointe Coupee Par.: A. R. Moldenke 715 (S). Rapides Par.: A. R. Moldenke 731 (S). Red River Par.: A. R. Moldenke 688 (S). Sabine Par.: A. R. Moldenke 701 (S). Saint Landry Par.: A. R. Moldenke 717 (S). Tensas Par.: Moldenke & Woods 528 (S). Vernon Par.: A. R. Moldenke 703 (S). Webster Par.: A. R. Moldenke 682 (S); Moldenke & Woods 548 (S). TEXAS: Camp Co.: Moldenke & Woods 562 (S). Chambers Co.: Gould & Reeves 8227 (Au—194206). CALIFORNIA: Sutter Co.: Balls 11992 (S). BRAZIL: Paraná: Dusén 14320 (N). São Paulo: Brade 5737

[Herb. Inst. Bot. São Paulo 6729] (N); *Campos Novaes s.n.* [Herb. Inst. Bot. São Paulo 1977] (N); *Campos Porto 36* [Herb. Inst. Bot. São Paulo 15730] (N); *Edwall s.n.* [Pirituba; Herb. Com. Geogr. & Geol. 654; Herb. Inst. Bot. São Paulo 15728] (N). ARGENTINA: Córdoba: *Lorentz 131* [Macbride photos 20316] (N—photo).

VERBENA CALLIANTHA Briq.

Additional bibliography: Moldenke, Phytologia 8: 417—420 (1962) and 8: 465. 1963; Moldenke, Résumé Suppl. 6: 7. 1963.

Briquet (1904) comments as follows about Chodat's original misidentification of this plant as V. erinoides Lam.: "Le *V. laciniata* Briq. (=*Erinus laciniatus* L. Sp. Pl. ed. 1, p. 879, ann. 1753 =*V. erinoides* Lamck. Ill. I, 57, ann. 1791) est une plante originaire du Pérou et au Chili à caractères très différents. Voy. à ce sujet: Briquet Lab. Balans. Parag. p. 9. "

Additional citations: ARGENTINA: Tucumán: *Venturi 3568* (Du—372488).

VERBENA CAMERONENSIS L. I. Davis

Additional bibliography: Moldenke, Phytologia 8: 421—425 (1962) and 8: 465. 1963; Moldenke, Résumé Suppl. 6: 3 & 4. 1963.

Rinehart found this species on south-facing gravel slopes in Coahuila, fruiting in March, but misidentified it as *V. pumila* Rydb. King found it growing along gravel roads in San Luis Potosí, fruiting in February.

The *L. I. Davis s.n.* [Southmost, Spring '41] isotype cited by me in Phytologia 8: 425 (1962) as deposited at Southern Methodist University is now in the Lundell Herbarium instead, and one of the *Lundell & Lundell 8698* specimens cited as in the University of Michigan Herbarium is now also in the Lundell Herbarium instead.

Additional citations: MEXICO: Coahuila: *Rinehart 298* (S). San Luis Potosí: *R. M. King 3983* (Au—189609), *4249* (Au—189794). Vera Cruz: *Galeotti 777*, in part [Macbride photos 24699] (N—photo).

VERBENA CANADENSIS (L.) Britton

Additional & emended synonymy: *Verbena montana* Hort. ex Sieb. & Voss in Vilmorin, Blumeng., ed. 3, 1: 825, in syn. 1895 [not *V. montana* Lillo, 1963]. *Verbena canadensis compacta grandiflora* Hurst ex Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958. *Verbena canadensis compacta* Hort. ex Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958. *Verbena canadensis rosea* Hort. ex Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958.

Additional bibliography: Meisn., Pl. Vasc. Gen. 2: 198. 1839; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Phytologia 8: 426—453 (1962) and 8: 465—468, fig. 7. 1963; Moldenke, Résumé Suppl. 6: 3, 10, & 11. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579 & 581. 1963.

Hardin describes the flowers of this species as blue-lavender. Pond found it in "annual-perennial association" along roadsides in sandy loam area recently burned in Texas.

Seeds of this species are available to the horticultural trade from Hav'a'look Gardens, Ridenour, Hillcrest Nursery, Thompson & Morgan (England), American Perennial Gardens (Garden City, Mich.), Mayfair Nurseries (Nichols, N. Y.), J. Herbert Alexander (Middleboro, Mass.), and Walter J. Guille (Syosset, N. Y.); the "compacta" form from Pearce (Moorestown, N. J.), Saier (Dimondale, Mich.), John Swain (Bristol), and Norsk Fro (Oslo); the "compacta grandiflora" form from Hurst & Son (London); and the "rosea" form from Ridenous, Joseph F. Martin, and Tucker & Son (Belleville).

The Leavitt s.n. [Cambridge, 13 Oct. 1898] distributed as V. canadensis is actually V. elegans H.B.K., while Ammons, Strausbaugh, & Bartholomew s.n. [Presque Isle, July 29, 1940] is V. stricta Vent.

Additional citations: FLORIDA: Leon Co.: R. K. Godfrey 54432 (S). MISSOURI: Jackson Co.: K. K. Mackenzie 62 (Mi). TEXAS: Madison Co.: F. W. Pond 27 (Au—194789). Robertson Co.: Hardin 547 (Au—191113). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. (Lu).

VERBENA CANESCENS H.B.K.

Additional bibliography: Moldenke, Phytologia 8: 469—475. 1963.

This species has been found in sandy clay soil on flats and on south-facing limestone-gravel slopes in Mexico. The C. T. Mohr s.n. [Hunter's Wharf, Sept. 5, 1892] distributed as V. canescens is actually V. supina L.

Additional citations: TEXAS: Jeff Davis Co.: A. R. Moldenke 645 (S). MEXICO: Aguas Calientes: Hartweg 177 (Lu). Coahuila: Rinehart 221 (S), 294 (S).

VERBENA CANESCENS var. ROEMERIANA (Scheele) Perry

Additional bibliography: Moldenke, Phytologia 8: 475—482. 1963; Moldenke, Résumé Suppl. 6: 4. 1963.

The H. J. Hamby 1637 distributed as this variety is actually V. cloverae Moldenke.

Additional citations: TEXAS: Bosque Co.: A. R. Moldenke 664 (S). Coryell Co.: Moldenke & Woods 587 (S). Menard Co.: A. R. Moldenke 657 (S). Schleicher Co.: A. R. Moldenke 655 (S).

VERBENA CAROLINA L.

Additional bibliography: Perry, Ann. Mo. Bot. Gard. 20: 356. 1933; Moldenke, Phytologia 8: 483—495. 1963; Moldenke, Résumé Suppl. 6: 11. 1963.

The O. M. Clarke 7348 (N) cited in Phytologia 8: 494 (1963) is actually V. recta H.B.K. The H. J. Hamby 747 distributed as

V. carolina is actually *V. halei* Small, *343* is *V. neomexicana* var. *hirtella* Perry, and *545* is *V. plicata* Greene, while *A. A. Eaton 496* is *V. scabra* Vahl.

Additional citations: ARIZONA: Cochise Co.: *A. R. Moldenke 781* (S). MEXICO: Chiapas: *Matuda 5295* (Ld). Guerrero: *Hinton 9287* (Rf). Hidalgo: *Lundell & Lundell 12391* (Rf). México: *C. L. Lundell 12209* (Rf); *Lundell & Lundell 12355* (Rf). Michoacán: *Hinton 13022* (Rf). State undetermined: *Collector undesignated s.n.* [Chico Chontal] (N).

VERBENA CAROLINA f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, Phytologia 8: 495—496. 1963; Moldenke, Résumé Suppl. 6: 4. 1963.

VERBENA CHEITMANIANA Moldenke

Additional bibliography: Moldenke, Phytologia 9: 9—11. 1963.

Material of this species has been misidentified and distributed under the name *V. santiagensis* Brücher. It has been collected in anthesis in January.

Additional citations: ARGENTINA: Catamarca: *Brücher & Brücher s.n.* [30/1/49] (Lu).

VERBENA CHILENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 9: 11—12. 1963.

The correct bibliographic citation for this name is "Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 78. 1942".

Additional citations: ARGENTINA: Mendoza: *H. H. Bartlett 19410* (Mi).

VERBENA CILIATA Benth.

Additional synonymy: *Verbena ciliata* Smith, in herb.

Additional bibliography: Moldenke, Phytologia 9: 12—22. 1963; Moldenke, Résumé Suppl. 6: 3, 4, & 10. 1963.

R. M. King found this plant in "open fields, abundant in open sun, sandy loam" in Puebla, while Rinehart found it "in flat sandy-clay soil" in Coahuila. Iltis, Koeppen, & Iltis encountered it in dry, rocky, level, heavily grazed, *Acacia-Hilaria-Opuntia* grassland savanna with many herbs like *Calochortus*, *Ruellia*, *Oxalis*, *Artemisia*, *Salvia*, *Mimulus*, etc., while R. F. Smith collected it "in pines" and "in alluvium fields".

Rinehart 217 has remarkably large flowers. *E. J. Alexander 2287* represents very well the coarse-leaved form of the species, while his *2288* is typical of the fine-leaved form. More work is needed to determine if more than one taxa are here represented.

Specimens of *V. ciliata* have been misidentified and distributed in herbaria as *V. pumila* Rydb.

The *H. C. Hanson 304*, distributed as *V. ciliata*, is actually var. *longidentata* Perry, while *Hayes 610* is *V. pumila* Rydb.

Additional citations: TEXAS: Cameron Co.: *Fleetwood 3711* (Au-

192387). Reeves Co.: A. R. Moldenke 644 (S). NEW MEXICO: Sierra Co.: A. R. Moldenke 632 (S). ARIZONA: Coconino Co.: Demaree 46154 (S), 46155 (S), 46191 (S). MEXICO: Chiapas: Matuda 5863 (Ld). Coahuila: Rinehart 217 (S). Guanajuato: Hartweg 176 (Lu—isotype). Hidalgo: Alexander & Hernandez Xolocotzi 276 [E. J. Alexander 2287] (N), 277 [E. J. Alexander 2288] (N). México: Hinton 869 (N, N), 2893 (K, N, Rf, W—1822199), 7466 (K, N, N, N); Leeds s.n. [near Amecameca, March 14, 1929] (Ld); C. L. Lundell 12210 (Rf). Michoacán: Iltis, Koeppen, & Iltis 540a (Ws); R. F. Smith M.97 (Au—218258). Nuevo León: R. F. Smith M.464 (Au—218066). Oaxaca: W. H. Camp 2581 (Mi, N); Conzatti & Camp 5237 (N). Puebla: R. M. King 2627 (Mi). Vera Cruz: C. L. Lundell 12535 (Rf).

VERBENA CILIATA var. LONGIDENTATA Perry

Additional bibliography: Moldenke, Phytologia 9: 22—26. 1963; Moldenke, Résumé Suppl. 6: 3 & 4. 1963.

Hanson describes this plant as "frequent in fields" and "abundant on prairies" in Cameron County, Texas.

Additional citations: TEXAS: Cameron Co.: Fleetwood 3444 (Au—192006); H. C. Hanson 304 (N), 322, in part (N).

VERBENA CILIATA var. PUBERA (Greene) Perry

Additional bibliography: Moldenke, Phytologia 9: 26—27. 1963; Moldenke, Résumé Suppl. 6: 3 & 10. 1963.

Additional citations: TEXAS: Lubbock Co.: Demaree 7460 (Au—198085).

VERBENA CLAVATA Ruíz & Pav.

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke, Phytologia 9: 29—32. 1963; Moldenke, Résumé Suppl. 6: 6. 1963.

The specimen represented by Macbride's photograph 17408 was deposited in the Berlin herbarium before World War II and is now destroyed.

Additional citations: PERU: Huánuco: Ruíz s.n. [Macbride photos 17408] (N—photo of cotype).

VERBENA CLAVATA var. CASMENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 9: 32—33. 1963; Moldenke, Résumé Suppl. 6: 6. 1963.

VERBENA CLOVERAE Moldenke

Additional synonymy: Verbena clovei Smith, in herb.

Additional bibliography: Moldenke, Phytologia 9: 34—37. 1963; Moldenke, Résumé Suppl. 6: 3 & 10. 1963.

Smith refers to this plant as a "low herb".

Additional citations: MEXICO: Nuevo León: R. F. Smith M.62 (Au—218096).

VERBENA CLOVERAE f. ALBA Lundell, Wrightia 2: 47 [as "cloveri"]. 1960.

Bibliography: C. L. Lundell, Wrightia 2: 47. 1960; Moldenke, Résumé Suppl. 6: 3. 1963.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Cyrus Longworth Lundell and Amelia A. Lundell (no. 15055) in open brush off U. S. Highway 83, 8 miles south of Zapata, Zapata County, Texas, on Marsh 31, 1958, and is deposited in the herbarium of the Texas Research Foundation at Renner, Texas. The form is known thus far only from the type specimen.

Citations: TEXAS: Zapata Co.: Lundell & Lundell 15055 (Rf—type).

VERBENA COCCINEA Raf., Herb. Raf. 50, nom. nud. 1833.

Bibliography: Raf., Herb. Raf. 50. 1833; E. D. Merr., Ind. Raf. 205 & 295. 1949.

I know nothing about this plant except that Merrill (1949) lists it as having been named and published by Rafinesque, with the type specimen from "Oregon or the Rocky Mountains".

VERBENA COCHABAMBENSIS Moldenke

Additional synonymy: Verbena myriofila Maria, Pl. Vall. Cochab. 38, hyponym. 1962. Verbena myriophylla Maria, in herb.

Additional bibliography: Maria, Pl. Vall. Cochab. 38. 1962.

Maria (1962) says for his V. myriofila "Hierba ramificada desdo la base, florece en cimas de color lila brillante: es un verdadero adorno que alegra el campo" and cites Hermano Adolfo Maria 180/4c from Tarani, Cochabamba, Bolivia, collected on December 16, 1954. I have examined a specimen of his no. 180 and found it to be typical V. cochabambensis.

Additional citations: BOLIVIA: Cochabamba: A. Maria 180 (Z).

VERBENA CONCEPCIONIS Moldenke

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke, Phytologia 9: 39—40. 1963.

VERBENA CORYMBOSA Ruíz & Pav.

Additional bibliography: Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Phytologia 9: 40—45. 1963.

Mattoon (1958) states that seeds of this species are offered to the horticultural trade by Thompson & Morgan (England), Hillier & Sons (Winchester), and John Forbes (Hawick).

xVERBENA COVASII Moldenke

Additional bibliography: Schnack & Covas, Revist. Argent. Agronom. 12: 224. 1945.

VERBENA CRITHMIFOLIA Gill. & Hook.

Additional bibliography: Moldenke, Phytologia 9: 46—49. 1963; Moldenke, Résumé Suppl. 6: 9 & 10. 1963.

The Brücher & Brücher s.n. [28/12/48] distributed as V. crithmifolia is actually V. hookeriana (Covas & Schnack) Moldenke.

Additional citations: ARGENTINA: La Pampa: Burkart s.n. [Herb. Inst. Bot. Darwinion 20575] (W—2340690). Río Negro: W. Fischer 90 (N).

VERBENA CUMINGII Moldenke

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke, Phytologia 9: 49—50. 1963; Moldenke, Résumé Suppl. 6: 10. 1963.

VERBENA CUNEIFOLIA Ruíz & Pav.

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke, Phytologia 9: 50—52. 1963.

Additional citations: PERU: La Libertad: López Miranda & Sagástegui 3543 (S).

xVERBENA DEAMII Moldenke

Additional bibliography: Gleason & Cronquist, Man. Vasc. Pl. 581. 1963; Moldenke, Phytologia 9: 53—54 & 59. 1963.

VERBENA DELTICOLA Small

Additional bibliography: Moldenke, Phytologia 9: 60—64. 1963; Moldenke, Résumé Suppl. 6: 4. 1963.

The Herb. Mexican Bound. Surv. s.n. [Plains near Leon Springs, September 7, 1852] was originally distributed as V. pumila Rydb. or perhaps was a mixture with that species. Fleetwood 6079 bears a notation by the collector "other plants had more dissected leaves". Herbarium material of V. delticola has also been distributed as V. racemosa Eggert.

Additional citations: TEXAS: Bexar Co.: Herb. Mexican Bound. Surv. s.n. [Plains near Leon Springs, September 7, 1852] (N). Hidalgo Co.: Fleetwood 6079 (Au—217043). MEXICO: Nuevo León: Pringle 11843(Au—183886); R. F. Smith M.10 (Au—218058).

VERBENA DEMISSA Moldenke

Additional bibliography: Hocking, Dict. Terms Pharmacog. 284. 1955; Moldenke, Phytologia 9: 65—66. 1963.

VERBENA DISSECTA Willd.

Additional & emended bibliography: Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 197. 1893; Schnack & Covas, Revist. Argent. Agronom. 12: 224. 1945; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke, Phytologia 9: 67—75. 1963; Moldenke, Résumé Suppl. 6: 7 & 8. 1963.

The C. Camargo 62124; Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.5048; Legrand 2664 & 2717; and E. Wall s.n. [15/10/

1946], distributed as V. dissecta, are actually V. tenera Spreng.
Additional citations: ARGENTINA: Tucumán: R. Rocha 3818 (Lu).

VERBENA DOMINGENSIS Urb.
Additional bibliography: Moldenke, Phytologia 9: 76—79. 1963; Moldenke, Résumé Suppl. 6: 8 & 10. 1963.

VERBENA DUSENII Moldenke
Additional bibliography: Moldenke, Phytologia 9: 79—80. 1963.
Additional citations: BRAZIL: Paraná: Dusén 7108 (Lu--isotype).

VERBENA ELEGANS H.B.K.
Additional bibliography: Moldenke, Phytologia 9: 82—86. 1963; Moldenke, Résumé Suppl. 6: 8. 1963.

The R. M. King 4513 cited in Phytologia 9: 85 (1963) as V. elegans appears to me better regarded as var. asperata Perry.

Additional citations: MEXICO: Coahuila: E. G. Marsh 1225 (Au—213647), 1258 (Au—213044).

VERBENA ELEGANS var. ASPERATA Perry
Additional bibliography: Moldenke, Phytologia 9: 86—89. 1963; Moldenke, Résumé Suppl. 6: 8. 1963.

Soderstrom states that the corollas of this plant are pink, "turning blue with age", and that the plant is "frequent on rocky clay sides of arroyo". King 4513, previously regarded by me as typical V. elegans H.B.K., is said by the collector to have had dark-lavender flowers and to have been abundant in gravelly soil, open sun.

Additional citations: MEXICO: Chihuahua: Soderstrom 847 (Mi). Tamaulipas: R. M. King 4513 (Au—189940, N). LOCALITY OF COLLECTION UNDETERMINED: Gizantoro s.n. [9.66] (Lu).

xVERBENA ENGELMANNII Moldenke
Additional synonymy: Verbena hastata var. β oblongifolia Nutt., Gen. 2: 40. 1818. Verbena hastata γ oblongifolia Nutt. ex Wood, Class-Book, ed. 41, 412. 1856. Verbena hastata var. oblongifolia Nutt. apud Small & Heller, Mem. Torrey Bot. Club 3: 12, in syn. 1892.

Additional bibliography: Nutt., Gen. 2: 40. 1818; Wood, Class-Book, ed. 41, 412. 1856; Small & Heller, Mem. Torrey Bot. Club 3: 12. 1892; Perry, Ann. Mo. Bot. Gard. 20: 267. 1933; Moldenke, Phytologia 9: 89—96. 1963; Moldenke, Résumé Suppl. 6: 1. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963; B.A.S.I.C. 43 (2): B.112. 1963.

Small & Heller (1892) and Perry (1933) place Nuttall's name doubtfully in synonymy under V. riparia Raf. However, Nuttall based his name on two collections from along the Delaware River near Philadelphia, Pennsylvania, and himself suggests that it represents a hybrid between V. hastata L. and V. urticifolia L. His description of the plant is: "4. hastata. Flowers deep blue;

rarely if ever hastate. Of this species there appears to be a very distinct variety near Philadelphia which I shall distinguish by the name of β. **oblongifolia*, having oblong-lanceolate deeply serrated leaves, merely acute, and not acuminated; spikes filiform, paniculate; flowers smaller, pale blue. May this be *V. paniculata* of Lamarck? but the flowers are not imbricated, nor in the least corymbose, it appears to be equally remote from *V. diffusa* of the same, but assuredly intermediate, if not a hybrid betwixt *V. hastata* and *V. urticifolia*. It has only occurred to me twice on the banks of the Delaware." It seems obvious to me that this cannot apply to the *V. riparia* Raf. as published by and typified by Small and Heller and known definitely only from Virginia and North Carolina — although it MAY be the same as Rafinesque's original plant which came from "Long Island, New Jersey, and the Chesapeak".

Additional citations: MISSOURI: Saint Louis: *Engelmann s.n.* [St. Louis, Aug. 1843] (Au—122804).

VERBENA FILICAULIS Schau.

Additional & emended bibliography: Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; Moldenke, Phytologia 9: 119—121. 1963.

Additional citations: BRAZIL: Minas Gerais: *Widgren s.n.* [1845] (Lu). Paraná: *Jönsson 1392a* (Lu).

VERBENA GOODDINGII Briq.

Additional bibliography: Moldenke, Phytologia 9: 131—141, fig. 8. 1963.

Langenheim reports finding this plant in rocky soil on top of a ridge.

Additional citations: NEVADA: Clark Co.: *Langenheim 3728* (Au—209322). NEW MEXICO: Luna Co.: *A. R. Moldenke 631* (S). ARIZONA: Gila Co.: *A. R. Moldenke 624* (S), *626* (S). Pima Co.: *A. R. Moldenke 625* (S). Santa Cruz Co.: *A. R. Moldenke 621* (S). CULTIVATED: California: *Balls 19756* (Au—122111).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr.

Additional bibliography: Moldenke, Phytologia 9: 141—146. 1963.

Additional citations: MEXICO: Sonora: *I. L. Wiggins 11775* (Au—182224).

VERBENA GRACILESCENS (Cham.) Herter

Emended synonymy: *Verbena gracilescens* Cham. ex Hicken, Chlor. Plat. Argent. 197. 1910.

Additional bibliography: Moldenke, Phytologia 9: 148—154. 1963.

Additional citations: BOLIVIA: Cochabamba: *A. Maria 178* (Z).

VERBENA GRACILIS Desf.

Additional bibliography: Moldenke, Phytologia 9: 154—158. 1963.

Additional citations: ARIZONA: Cochise Co.: A. R. Moldenke 617 (S). MEXICO: Aguas Calientes: Hartweg 174 (Lu). Federal District: Berlandier 578 (Lu).

VERBENA HALEI Small

Additional bibliography: Moldenke, Phytologia 9: 160—175, fig. 9. 1963.

Gould & Hycka encountered this plant in open oak-mesquite woods in Texas.

Additional citations: ALABAMA: Cullman Co.: Moldenke & Woods 504 (S). MISSISSIPPI: Jefferson Co.: A. R. Moldenke 738 (S). Warren Co.: Moldenke & Woods 525 (S, Z, Z). Yazoo Co.: Moldenke & Woods 524 (S). LOUISIANA: Avoyelles Par.: A. R. Moldenke 722 (S). Bienville Par.: A. R. Moldenke 687 (S); Moldenke & Woods 541 (S). Bossier Par.: A. R. Moldenke 679 (S); Moldenke & Woods 549 (S). Caddo Par.: Moldenke & Woods 551 (S). Caldwell Par.: Moldenke & Woods 535 (S). Claiborne Par.: Moldenke & Woods 543 (S). DeSoto Par.: A. R. Moldenke 693 (S). Franklin Par.: Moldenke & Woods 530 (S), 564 (S). Jackson Par.: Moldenke & Woods 532 (S). Lincoln Par.: Moldenke & Woods 538 (S). Natchitoches Par.: A. R. Moldenke 697 (S). Pointe Coupee Par.: A. R. Moldenke 720 (S). Red River Par.: A. R. Moldenke 690 (S). Tensas Par.: Moldenke & Woods 527 (S). Webster Par.: A. R. Moldenke 681 (S); Moldenke & Woods 547 (S). TEXAS: Anderson Co.: Hardin 531 (Au—191114). Bell Co.: Moldenke & Woods 586 (S). Camp Co.: Moldenke & Woods 560 (S). Cameron Co.: Fleetwood 3508a (Au—192305). Cass Co.: Moldenke & Woods 558 (S). Comanche Co.: A. R. Moldenke 658 (S); Moldenke & Woods 595 (S). Harrison Co.: A. R. Moldenke 675 (S). Hill Co.: Moldenke & Woods 567 (S). Hopkins Co.: Moldenke & Woods 565 (S). Lynn Co.: Moldenke & Woods 598 (S). Marion Co.: Moldenke & Woods 553 (S). Morris Co.: Moldenke & Woods 557 (S). San Patricio Co.: Gould & Hycka 7990 (Au—194466). Upshur Co.: A. R. Moldenke 673 (S). Van Zandt Co.: A. R. Moldenke 672 (S). Wood Co.: A. R. Moldenke 670 (S); Moldenke & Woods 563 (S).

VERBENA HASTATA L.

Additional synonymy: Verbena hastata var. paniculata (Lam.) Farwell, Ann. Rep. Comm. Parks & Boul. Detroit 11: 82. 1900. Verbena paniculata var. pinnatifida Schau. ex Perry, Ann. Mo. Bot. Gard. 20: 278, in syn. 1933. Verbena hastata γ Poir. apud Perry, Ann. Mo. Bot. Gard. 20: 278, in syn. 1933. Verbena hastata var. paniculata Farwell ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940. Verbena hastata var. pinnatifida Gray ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940. Verbena hastata Michx. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. *Verbena hastata* var. *pinnatifida* (Lam.) Britton ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. *Verbena lacunosa* Schrad. ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947 [not *V. lacunosa* Mart., 1941]. *Verbena lanceolata* Boldo ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947 [not *V. lanceolata* Willd., 1825]. *Verbena paniculata* Schau. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. *Verbent hastata* L. apud Deam, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 58: 95, sphalm. 1948. *Verbena hastata* x *simplex* Gates, in part, ex Moldenke, Résumé 365, in syn. 1959. *Verbena hastata* x *stricta* Elmore ex Moldenke, Am. Midl. Nat. 59: 359, in syn. 1958 [not *V. hastata* x *stricta* Allen, 1958, nor Anderson, 1958, nor Ravenel, 1959, nor Rydb., 1894]. *Verbena hastata* var. *lanceolata* House ex Moldenke, Résumé 366, in syn. 1959. *Verbena hastata* var. *pinnatifida* Britton ex Moldenke, Résumé 366, in syn. 1959. *Verbena astrata* L., in herb. *Verbena hastata* var. *pinnatifidum* (Lam.) Sch. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. *Liatris pinnata* Nash ex Moldenke, Résumé Suppl. 3: 33, in syn. 1962. *Verbesina biserrata* Nash ex Moldenke, Résumé Suppl. 3: 42, in syn. 1962. *Verbena haetata* L. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962.

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Slender perennial herb, 1--2.3 m. tall, mostly unbranched or short-branched only above, varying from glabrous to more or less sparsely rough-pubescent; roots fibrous, with perennial rootstocks; stems sometimes 5 or 6 per plant, usually 4--15 dm. tall, sometimes taller, mostly simple or else branched above, purplish, leafy, obtusely tetragonal, sulcate, slender, stiff, erect, roughish-puberulent or rough-pubescent, with short or minute and stiff antrorse hairs; branches axillary, short, ascending or erect, the lower ones often leafy and undeveloped; leaves decussate-opposite; petioles slender, 1--2.6 cm. long, narrowly margined, rough-hirsute; leaf-blades membranous, dark-green above, paler beneath, lanceolate to oblong-lanceolate or occasionally ovate-lanceolate, 4--18 cm. long, 5--7.5 cm. wide, acute or subacuminate to gradually acuminate at the apex, narrowed or rounded at the base or even cuneately prolonged into the petiole, serrate to coarsely serrate or incised, sometimes sharply and irregularly incised-serrate or incised-dentate, rarely deeply pinnatisect or pinnatifid, the lower only often hastately 3-lobed at the base, varying from glabrous or strigillose to occasionally rough-pubescent on both surfaces, the venation strong, impressed above, prominent beneath; spikes strict, erect or even stiffly erect, linear, usually numerous, paniculate or paniculate-corymbose, pedunculate, short and compact, opposite, borne at the tips of the stems and branches, usually one spike terminal, with 2 to several opposite pairs directly beneath it, 6--13 cm. long, the rachis flowerless for the lowest 2.5 cm., densely many-flowered above and subtended by a minute subulate bractlet; flowers small, sessile, about 4 mm. long; floral bractlets ovate or lanceolate-subulate, commonly a little shorter than or nearly as long as the calyx, acuminate at the apex; calyx green, turning greenish-purple, 2--3 mm. long, minutely oubescent on the outside, 5-ribbed, its teeth or lobes acute, unequal, with short subulate tips, more or less connivent; corolla hypocrateriform, varying from blue, deep-blue, violet-blue, or light purplish-blue to bluish-purple, blue-purple, blue-violet, dark blue-violet, bluish-lavender, or intense bluish-purple, its tube curved, somewhat longer than the calyx, pubescent on the outside, the throat marked with a ring of hairs, the limb 2.5--5 mm. wide, the lobes rounded, the 2 upper ones smaller; mature fruits crowded and overlapping on the fruiting-spikes, each about 3 mm. long, obtuse at the apex, obtusely tetragonal; cocci pale-brown or sometimes brown, linear, 1.5--2 mm. long, minutely puberulent, the dorsal side nearly smooth or very faintly striate with 3 ridges, the commissural face muriculate or almost smooth, sometimes reticulate at one end; chromosome number: 2n = 14.

This common and widespread species grows naturally from Nova Scotia west to British Columbia and south to Florida, Texas, and Arizona. It is, however, quite rare and sporadic in the southeastern, southern, and southwestern states and rather local in the far west. Much of the peripheral material appears to be var. scabra Moldenke. Perry states definitely that it grows "throughout the United States", but we have no records of it as yet -- nor does she give any -- from Arkansas, Alabama, or Mississippi. Julius King, in the reference cited above (1935), reproduces a map showing this species as occurring in every state of the United States and in every Canadian province. It is hoped that curators of herbaria in which there are specimens of this species from provinces, states, and counties not blacked-out on our map will send such specimens to the author for verification and recording so that future editions of our map may be more complete. The specific name of the species is sometime uppercased for no valid reason.

Walpers (1845) places V. hastata in his Section Verbenaca, Subsection *Inermes*, Group *Foliosae*, Subgroup *Micranthae*, and Secondary Subgroup *Holophyllae*. Schauer (1847) admits that Lamarck's *V. paniculata* and Linnaeus' *V. hastata* are conspecific, but, curiously, adopts Lamarck's name as more appropriate, saying "*V. hastata* ne tanquam varietas quidem distinguenda, quum in eadem planta folia primordialis nunc hastata nunc subhastata nunc, et saepius, lanceolata basi cuneata invenias. Nomen aptius etsi recentibus praeferendum habui. Maxime recedit a sequenti [*V. urticifolia*] foliis, spicis, floribus, panicula."

Common names recorded for this plant are "American vervain", "blue verbena", "blue-verbena", "blue verbenna", "blue vervain", "blue vervian", "clowne's all-heal of New England", "common vervain", "compound-panicled vervain", "Eisenkraut", "false vervain", "halberd-leaved verbena", "halberd-leaved vervain", "halbert-leaved vervain", "hoary vervain", "holy herb", "iron-weed", "ironweed", "panicled vervain", "purple verbena", "purple vervain", "purvain", "shades", "simpler's joy", "simpler's-joy", "simplers' joy", "tall blue vervain", "verbena", "vervain", "vervaine bleue", "verveine bleue", "verveine hastée", "verveine paniculée", and "wild hyssop". It should be noted, however, that the name "false vervain" is applied also to *V. litoralis* H.B.K.; "hoary vervain" is more correctly applied to *V. stricta* Vent.; "holy herb" and "simpler's-joy" are wellknown old names for *V. officinalis* L.; "common vervain" is applied to *V. officinalis* and to *V. urticifolia* L.; and "verbena" and "vervain" apply to many species as well as to the genus as a whole. The name "iron-weed" is often given as a name for the genus as a whole -- from the German name "Eisenkraut" -- but is also a recognized name for the members of the composite genus *Vernonia* Schreb., in association with which *V. hastata* often grows.

The species is quite variable in pubescence and leaf-form. A form that is heavier and rougher than normal is well represented by *J. H. Christ 5962* and *Gaiser 1522W* (but the latter collector's *490*, *490G*, *1763PE*, and *2367RG*, from the same area, are normal). Very pubescent plants are represented by *F. E. Leonard s.n.* [Salt Lake City, July 17, 1884] and a very conspicuously canescent form by *C. B. Maguire 20098*, *E. Runyon 280*, and *Over 17223*. In general, the more densely pubescent forms are more western in distribution and may possibly be worthy of nomenclatural designation. Many, if not all of them, may prove to belong to var. *scabra*, a taxon described since most of the specimens of *V. hastata* herein cited were examined and annotated. The leaf-surfaces of *English 477*, *C. M. Rogers 4981*, *O. A. Stevens s.n.* [Kindred, Aug. 20, 1944], and *Tidestrom 1718*, all deposited in the United States National Herbarium, seem rougher than normal, and these specimens, too, may very well better be placed in var. *scabra*.

Some leaves on *L. H. Pammel s.n.* [Jul. 18, 1920] are beautifully pinnatisect; on *Pammel & Blackwood 3638* they are all deeply pinnatisect; on *Tolstead s.n.* [Aug. 1, 1935] some are deeply pinnatisect; *Fink s.n.* [Fayette, July 19, 1899] also shows pinnatisect leaves. *L. H. Pammel s.n.* [Dubuque, 6/20/91] has all the leaves very decidedly hastata and laciniate-dentate and may actually be a hybrid with *V. officinalis*. Beautifully hastate leaves are also seen on *B. H. Patterson s.n.* [July 12, '86], *Geyer s.n.* [Beardstown, July 1842], *B. T. Butler 4292*, *J. L. Sheldon s.n.* [Lincoln, July 28, 1898], and *Schuette s.n.* [Green Bay, Aug. 4, 1887]. Some hastate leaves are also seen on *R. F. Cain 281*, while on *J. F. Macbride 304* they are deeply cut.

The type of *V. hastata* var. *lanceolata* was collected by Charles Horton Peck at Boston Corners, Columbia County, New York, and is deposited in the herbarium of the New York State Museum at Albany, while that of the so-called *V. hastata* x *stricta* Elmore was collected by Clarence Jerome Elmore at Talmage, Otoe County, Nebraska, in 1890, and is deposited in the herbarium of William Jewell College at Liberty, Missouri. The actual type of *V. hastata* is a specimen in the Linnean Herbarium at London — an isotype at Stockholm bears on its obverse side, in pencil, the note "cfr. Verb. 10 hastata L. sp. pl. 20" and in ink (in an unknown handwriting) "*Verbena paniculata* Lam." followed in pencil by "=*hastata* L. K" and in ink again (in the same unknown handwriting) "*Verbena*", followed in ink (in Linnaeus' handwriting) "10 *hastata*" followed by (in the same unknown hand) "Linn." On the reverse side, in pencil, is inscribed "Linné herb." and in ink "Herb. Alstroemeri" and, also in ink (in Dahl's handwriting) "a Linne f." The Nietzel specimen in the same herbarium is inscribed on the obverse side "10 *hastata*? K", and on the reverse side, in pencil, "Linné herb." and in ink (in Montin's handwriting) "Verbena (hastata) tetrandra, spicis longis acuminatis, foliis hastatis. Syst. nat. ed. 13. n. 11. Habitat in Canadae humidis. ♃. Specimen ex horto Upsal. communicavit hortul Nietzel."

Sabbat (1775) placed *Verbena americana, spici multiplici, foliis urticae angustissimis, floribus caeruleis* Herm. and *V. altissima, americana* Herm. under *V. bonariensis* L., apparently in error. His color plate 54, inscribed with Hermann's names, is plainly *V. bonariensis*. Hermann apparently had two plants which he thought were distinct, one with blue and the other with purple flowers; Boerhaave kept them separate, but Linnaeus made the purple on a variety β of the blue in his Hort. Ups. (1748). Hermann also had a white-flowered one which is probably *V. hastata* f. *albiflora* Moldenke. Linnaeus (1737) placed "*Verbena americana altissima, urticae foliis angustioribus, spicis brevibus. floribus caeruleis* Boerh." as a variety α of "*Verbena foliis ovatis, caule erecto, spicis filiformibus*" (which is *V. urticifolia* L.).

In spite of the quite characteristic appearance of this species, specimens of *V. hastata* have been misidentified and distributed in herbaria under the names *V. angustifolia* Michx., *V. biserrata* H.B.K.,

V. bracteosa Michx., V. canescens H.B.K., V. caroliniana Michx., V. hasta L., V. hastata x urticaefolia Chase, V. hastata x urticifolia Eggert, V. officinalis L., V. rugosa Michx., V. simplex Lehm., V. spura L., V. striata Vent., V. stricta Vent., V. stricta x hastata Eggert, V. stricta x urticifolia Stevens, V. urticaefolia L., V. urticifolia L., V. urticifolia x hastata Schneck, "Verbenaceae Hastata", Buchnera americana L., Teucrium occidentale A. Gray, and Veronica sp.

On the other hand, the Havard s.n. [San Antonio] and Vasey s.n. [Socorro, May 1881], distributed as V. hastata or as V. pinnatifida, are actually V. ambrosifolia Rydb.; A. E. Radford 514 is V. bonariensis L.; Lapham s.n. [Milwaukee] and A. B. Seymour 1062 are xV. engelmannii Moldenke; Chesnut 1 is V. lasiostachys Link; Drew s.n. [Oakland, June 25, 1889] and Pupils L. A. High School s.n. [near "The Palms", May 1901] are V. lasiostachys var. septentrionalis Moldenke; Collector undesignated s.n. [Florida] is V. neomexicana var. xylopoda Perry; T. J. Hale s.n. [Madison] is xV. perriana Moldenke; K. Brandegee s.n. [May 1916] and Jepson s.n. [Alamo Creek, June 8, 1884] are V. robusta Greene; Fassett & Wilson 9776 and Skavlem s.n. [Janesville, July 23, '89] are xV. rydbergii Moldenke; Bakken 122, W. S. Blaine s.n. [Durant, June 23, 1935], Clevenger s.n. [Columbus, June 21, 1904], Cory 50269, J. Davis 40 & 4461, Duan & Isely 5707, C. Epling s.n. [Post Falls, July 1929], Evers 198, Ferril s.n. [Sept. 1, 1902], Grinstead 85, Harding 59, Herb. Ill. State Mus. 15871, Herb. Univ. Calif. Los Angeles s.n. [Aug. 1937], Milburge 969, B. H. Patterson s.n. [Sept. 2, 1918], Piesbergen s.n. [July 2, 1942], F. J. W. Schmidt s.n. [Oct. 1, 1934], Warner s.n. [Liberty], J. M. Winter 20, and M. Zimmerman s.n. [Red House, Aug. 8, 1935] are V. stricta Vent.; J. M. Fogg 18013 is V. urticifolia L.; Ashe s.n. [Roan Mtn., July 1893] is V. urticifolia var. leiocarpa Perry & Fernald; Havard s.n. [San Antonio] is V. wrightii A. Gray; H. B. Parks s.n. [White Creek, 9-7-47] is V. xutha Lehm.; and Radford & Stewart 351 is Stylodon carneus (Medic.) Moldenke; while Cory 50298, Elmer 537, J. M. Johnson 254, Leiberg 2630, and O. A. Stevens s.n. [Aug. 4, 1936] are all definitely V. hastata var. scabra Moldenke.

Verbena hastata inhabits a great variety of situations, but usually wet, swampy, marshy, damp grassy, or boggy places, but sometimes also plain grassy, waste, or even dry waste places or dry sand. It has been collected in woods and open woods, in low woods along streams, in thickets and moist thickets, swales, boggy clearings, and orchards, on low, moist, or wet prairies, in bogs, cold bogs, and swamps, in wet and swampy spots, and on creek-bottoms, creek-banks, and sand flats. It apparently inhabits low, swampy, or dryish open ground and damp open ground near streams, low marshy land, alluvial mud, and lakeshore peat. Collectors report it from low, grassy, wet, boggy, moist, and bottomland pastures, from low, moist, wet, moist grassy, boggy, swampy, alluvial, and upland meadows, from beaches, sand beaches along rivers, and the sandy beaches of ponds, from wet moist, and roadside ditches, the edge of lotus ponds, and the banks of ditches. They have found it along roadsides, grassy roadsides, sandy roadsides, fencerows, brooksides, streamsides, and field drainage ditches, even from along more or less dry streams, and on streambeds, from the edges of lakes and on dry lake beds, in deep stony cuts and small bogs, from lowlands, swampy lowlands, bottomlands, pasturelands, and waste land, from marshes as well as from salt, tidal, and reclaimed marshes and springy areas, from the grassy margins of sphagnum bogs, open pond banks, grassy openings in thickets, drier areas of bogs, shady stream banks, swampy hillocks, the borders of brackish ponds and of salt marshes, the edge of open swamps and of brackish marshes, the peaty borders of marshes and dry peaty borders of brackish marshes. It has been collected on sand mounds, ridges, and hills, along ditches in open prairie fields, on ledges, on or among sand dunes, on sand bars, dry open roadsides, in ditches, at the edges of ponds and the bottoms of small ravines, at the edge of runs, on very dry lots, along creeks in open woods, at the edges of mowed fields, and on the open range, on rich knolls and on hummocks in marshes. It apparently inhabits moist or wet soil, wet rich soil, clay, sandy or dry sandy soil, alluvial soil, moist loam, sand, imperfectly drained sandy clay soil, and the sandy soil of lake margins, open and wet open fields, open woods, low and damp fields, old or abandoned fields, dry fields, pasture or abandoned pasture fields, riverbanks and riverbottoms, irrigation ditch banks, moist, stream, canal, and rocky river banks, the sandy rims of rivers, lake and sandy lake shores, rocky or old gravelly shores, as well as sandy and rocky shores or sand-and-gravel shores. It has been found at altitudes of practically sea-level to 7000 feet, flowering from June to October, or, in the far south, as early as April, and fruiting from July to October.

Darlington (1936) says that it is common on the floodplain of the Carp River in the Porcupine Mountains of Michigan, while Grassl reports it as "common in moist places at edge of marshes" in that state. Schallert reports that in Wisconsin it is found "in moist fields, meadows, and waste places, a wild flower and weed, not obnoxious, the root and herbage used unofficially medicinally". H. V. Smith (1961) says that the Amerinds made a tea from the leaves in Michigan and used the plant in treating nosebleed; also that it is readily grown in a moist garden. Gates (1940) calls it a hemicryptophyte from "low open woods and thickets, wet prairies, and waste ground" throughout Kansas "except the westernmost counties". McKee describes it as "common in pastures" in Newton County, Indiana, and Welch as "common along roadsides" in Jasper County, while Deam found it "covering an area of about half acre in low places along roadside and in an adjacent field" in the same state. In Illinois it is said by Jones (1945) to be "common" along "roadsides and fields", while Gates found it "in *Iris* association on beaches". In Connecticut it was found by Dwyer to be associated with daisy [*Leucanthemum vulgare*] and *Rudbeckia hirta* in sandy soil", while in Pennsylvania it was found by Benner in "low ground especially in waste places, frequent" and by H. E. Stone in "swampy meadows and along streams, frequent." In Iowa it is said by Hayden to be found "in moist soil in pastures, common near ponds and swales", while Pammel says it is "a common weed in pastures, low ground, associated with *Vernonia fasciculata*, *Scirpus atrovirens*, *Cyperus esculentus*, and *Lythrum alatum*" and in "low grounds, Iowa drift sheet, associated with *Carex vulpinoidea*, *Verbena urticifolia*, *Epilobium coloratum*, *Polygonum acre*, *Alnus incana*, and *Aster novae-angliae*" and "a weedy plant in low ground, pastures, etc., associated with *Silphium perfoliatum*, *Rudbeckia laciniata*, *Salix longifolia*, and *Solidago serotina*", and Pammel & Spiker found it in "black soil, low ground in pastures, associated with *Vernonia fasciculata*, *Poa pratensis*, *Cyperus esculentus*, and *Scirpus atrovirens*." Benson found it in "riverbank thickets in treeless and transition zone" in Oregon, and "in sandy soil, Carolinian zone" in New York. In Colorado Ewan says it is "local, only in heavy herbage of sinks among sandhills" or "frequent as colonies along barrow ditches beside railroad grades", while in Minnesota Mearns says it is "common in wet places." In Washington it is said by Beattie & Chapman to be "common on hills", while St. John reports it as "occasional in meadows or by stream banks in Upper Sonoran zone" M. E. Jones describes it as a plant of the "middle temperate life zone". In New York it is said by Carpenter to be "common along roadsides of the lower altitudes" and Weber says "common in fields". Tosh reports it as "common in all low wet land" in Raleigh Count, West Virginia. In Iowa it was found by Pammel & Zimmerman "in low ground with *Convolvulus sepium* and *Helianthus grosseserratus*"; in Oklahoma it was found by Hopkins "in moist damp copses among *Salix*"; in California it grows with *Stachys* and *Scirpus* according to Nobs & Smith; and in Kansas it is said to be "common in wet places in prairies" by Hancin. Small describes it as found "in sand and clay soil along roadsides through salt marshes" in New Jersey, while Maguire reports that in Utah it is "a common weed along canal banks", "frequent on ditch banks", "frequent in pastures and marsh lands", and "a common weed in wet places". In Michigan it was found by Hamerstrom in sandy loam soil with *Asclepias syriaca*, *A. incarnata*, *Lycopus americanus*, and *Phleum pratense*, while McVaugh describes it as "abundant at edge of swampy deciduous woods".

G. Johnson (1926) says that it flowers from June to September and is to be found "almost throughout the United States and Canada" in moist meadows, roadsides, and waste places. He says "for a description of this flower, its insect visitors, and the traditions clinging to its name, see page 185 of Nature Library volume on WILD FLOWERS. For color and appearance in natural surroundings, see full-page color illustration facing page 176." In the "New Nature Library", however, in volume 6, by N. Blanchan (in my possession), the description to which he refers is on page 40 and the color plate is a half-page (not "full-page") facing that page. It is stated there that the flowers are pollinated by bees, which "are usually seen clinging to the blooming spikes, and apparently sleep on them." It is also stated there that "John Burroughs, ever ready to say a kindly, appreciative word for any weed, speaks of its drooping, knotted threads, that 'make a pretty etching upon the winter snow.'" The reference here is to the fruiting spikes, which, however, are not "drooping", but firmly erect. Burroughs was probably referring to the spikes of *V. urticifolia* rather than those of *V. hastata*. There is no mention in Stapf's "Index Londinensis" of any color plate facing a page 176.

Palmer (1935) states that in Missouri *V. hastata* inhabits "low open woods, wet prairies, fields, and waste ground. Circumneutral. General, but commonest in northern and central" portions of the state. In his 1916 publication he cites his *nos. 189*, *1085*, *1086*, and *2483* from Jasper County, not yet seen by me, and in his 1930 publication he cites his *no. 23505* and *C. K. Allen s.n.* from Suffolk County, Massachusetts. Grant & Thorne (1955) record the species from Hancock County, Iowa, and cite their *no. 14568*; Loew (1949) records it from Huntington County, Indiana, and says it is "medicinal"; and C. N. Jones (1941) cites *R. Walker s.n.* from Hocking County, *W. Goslin s.n.* from Fairfield County, and *L. E. Yarman s.n.* from Knox County, Ohio. In his 1943 work he cites *C. H. Jones s.n.* from Marion County and in his 1945 work *Harper & Konopka s.n.* from Carroll County, Ohio. Schauer (1847) cites unnumbered "Bott" [=Boott ?], Pursh, and Rafinesque specimens from "monosis Americae septentr." and an Engelmann collection from Missouri. Possibly his "Bott" citation refers to the same collection as the "Boot" collection cited below from the Stockholm herbarium, collected in Boston in 1816.

Jepson (1943) records *V. hastata* from Humboldt County, California; E. L. Braun (1943) records it from Boone and Morgan Counties, Kentucky; Deam, Kriebel, Yuncker, & Friesner (1945) record it from Delaware and Huntington Counties, Indiana; Stebbins (1929) records it from Mount Desert Island, Maine; and Tatnall (1947) from Wicomico County, Maryland. C. W. Lowe (1943) records it from "thickets and river valleys, frequent, eastern area - Norden, Riding Mt. Nat. Pk.", Manitoba. In Proc. Ind. Acad. Sci. 56: 110 (1947) it is recorded from Decatur County, Indiana, and in 60: 87 (1951) from Parke County. Ogden, Steinmetz, & Hyland (1948) record it from Androscoggin, Franklin, Kennebec, Knox, Lincoln, Sagadahoc, and Somerset Counties, Maine. Jepson states that the species was collected in the Grand Island, Lower Sacramento, region of California, in 1841 by the Wilkes Expedition. Allard & Leonard (1943) record it from Bull Run Mountain, Virginia [Prince William County?]. In Proc. Iowa Acad. Sci. 62: 181 (1955) it is said to be common in Johnson County, Iowa. It is recorded as adventive in England by Douglas H. Kent in a letter to me dated November 28, 1949; *Mrs. Rothwell & Rayner s.n.* is cited from Christchurch, South Hants, England, by Druce in Rep. Bot. Exch. Club Brit. Isles 1923: 205 (1924). Fernald (1921) says "not seen west of Hants County" in Nova Scotia.

The *E. S. Steele 98*, collected in Camden County, New Jersey, bears a misleading printed label reading "Plants of Pennsylvania"; *J. Torrey 125*, collected at Hoboken, New Jersey, bears a label reading "Hoboken, N. Y." and "Lect. circa Hoboken! in Canada." The "East Caledonia" County, Vermont, recorded for this species by me in my Résumé 5 (1959) is an error for Caledonia County. The Block Island, "Massachusetts", recorded on page 6 of the same work is an error for Block Island, Rhode Island, and the "Girard" County, Minnesota, recorded on page 19 also appears to be an error of transcription. There is no such county in the state, nor can I locate a town by that name there, nor a county by that name elsewhere.

The species is used locally in medicine in Florida, according to Curtiss, while in Michigan the leaves are "used to make vervain tea, an old-fashioned spring tonic". H. N. Webster (1942) says that it is "an emetic herb used from earliest times in Colonial medicine". Bausor (1937) reports that an infusion or fluid-extract of the herb is used as an expectorant and also to stimulate perspiration, while "large doses are emetic".

The *Black 36-5881* from Ohio looks somewhat like x*V. engelmannii* Moldenke — as to the difference between *V. hastata* and x*V. engelmannii*, see my discussion of the latter in these notes. The *Baldwin & Breitung 3356*, distributed as *V. hastata*, is actually *Veronica longifolia* L., while *C. M. Long s.n.* [Owne Sound, Ont., 1873], also so distributed, is *Veronicastrum virginicum* (L.) Farwell, both in the *Scrophulariaceae*.

Verbena hastata apparently hybridizes freely with related species — its hybrid with *V. carolina* L. is x*V. matritensis* Moldenke, with *V. hispida* Ruíz & Pav. is x*V. noacki* Moldenke, with *V. officinalis* L. is x*V. baileyana* Moldenke, with *V. simplex* Lehm. is x*V. blanchardi* Moldenke, with *V. stricta* Vent. is x*V. rydbergii* Moldenke, and with *V. urticifolia* L. is x*V. engelmannii* Moldenke. MacDougal (1907) suggests that it also hybridizes with *V. bracteata* Lag. & Rodr. in the wild. However, he cites no specimens, gives no description of the supposed hybrid, and does not say that he actually ever saw any such hybrid plants. Briquet (1894) regarded *V. pinnatifida* Lam. as a hybrid between *V. hastata* and *V. officinalis* (that is, as what is now known as x*V. baileyana*), but this does not seem likely nor, if true, would it invalidate the latter name, since Lamarck did not propose it as a hybrid.

Nair & Rehman (1962) describe the pollen of a "*V. pinnatifida*" as "Size 43 μ (range 42--46 μ). Endocolpium lalongate (5.2 x 14 μ).

Ectine surface psilate (very faint LO)." They base this on what appears to have been a cultivated specimen from Lucknow, India — "*N*[ational] *B*[otanic] *G*[arden] *16673*; *Sl*[ide] *2729*". Not having seen this specimen, I am, of course, not at all certain that the information actually applies to *V. hastata*, a species not as yet known to me as cultivated in India — while *V. tenuisecta* Briq., is there cultivated and might carelessly have been misidentified as "*V. pinnatifida*" if only the leaf character were considered.

It is worth pointing out here that the homonyms referred to in the synonymy of *V. hastata*, and elsewhere, are disposed as follows: *V. lacunosa* Mart. is *Stachytarpheta lacunosa* Schau.; *V. lanceolata* Willd. is *V. litoralis* H.B.K.; the *V. pinnatifida* of M. E. Jones is *V. wrightii* A. Gray, while that of Nuttall and of Schauer are *V. bipinnatifida* Nutt.; *V. hastata* x *angustifolia* Hill is x*V. blanchardi* Moldenke; the *V. hastata* x *bracteosa* Gates is *V. bracteata* Lag. & Rodr., while that of Pammel is x*V. moechina* Moldenke, and that of Rydberg and of Schnack are x*V. perriana* Moldenke; another "*V. hastata* x *simplex* Gates" is *V. simplex* Lehm.; *V. hastata* x *spuria* Haartman is x*V. baileyana*; the *V. hastata* x *stricta* Allen is *V. stricta* f. *albiflora* Wadmond, while that of Anderson, of Gates, and of Rydberg are x*V. rydbergii*, and that of Ravenel is *Stylodon carneus* (Medic.) Moldenke; the *V. hastata* x *urticaefolia* of Blanchard, of Chase, of Dutton, of McCoy, of Norton, of Pammel, and of Peck are all x*V. engelmannii*; *V. hastata* x *urticifolia* of Blanchard, of Dermen, of Eggert, of Farwell, of Perry, and of Pringle are all x*V. engelmannii*, while that of Gates is x*V. illicita* Moldenke; *V. hastata* var. *oblongifolia* Andrews is *V. urticifolia*, while that of Nuttall is x*V. engelmannii*; and *V. urticifolia* x *hastata* Gates is x*V. engelmannii*. In my Prelim. Alph. List Invalid Names 46 (1940) I followed Perry (1933) in placing *V. hastata* f. *rosea* Farwell and *V. hastata* var. *paniculata* f. *rosea* Farwell in the synonymy of *V. hastata* — however, these are now regarded as being in the synonymy of *V. hastata* f. *rosea* Cheney. She followed Small & Heller in placing *V. hastata* var. *oblongifolia* in the synonymy of *V. riparia* Raf., but I am convinced now that it belongs with x*V. engelmannii*.

Briquet (1894) refers to *Verbena pinnatifida* Lam. as a hybrid between *V. hastata* and *V. officinalis*. I believe that this was merely a guess on his part because of the more or less lobed condition of the leaves, which Lamarck inaccurately described as "pinnatifid", on the plant in question. Lamarck's plant is probably only a form of the very common and variable *V. hastata* and I do not think it is of hybrid origin. Examination of Lamarck's type ought to settle this point. His original description is "Verbena pinnatifida. V. spicis filiformibus, foliis inciso-pinnatifidis grosse serratis. Ex America septentrionalis 4."

Briquet also keeps *V. hastata* and *V. paniculata* as separate species.

Roberts (1929) quotes Haartman (1751) to the effect that "Another hybrid, between *Verbena hastata* female and *Verbena spuria* male is stated to have originated naturally in the Botanical Garden [at Uppsala, Sweden] in 1748, perishing two years later. It is recorded as arising in the same bed with the two species named above, 'but not through dissemination, considering that no one had the seeds here hitherto, nor through a planting of it, since it had not previously been seen within the country.'" It should be noted that Roberts dates the L., Amoen. Acad. 3: 43 reference as "1764". This hybrid is now known as x*V. baileyana* Moldenke.

The *Henderson 795* collection from "Columbia River Cascades", cited below from Wasco County, Oregon, may actually be from Hood River County, Washington — H. M. Gilkey, in a letter to me dated January 16, 1848, says that the species grows in both counties. In Castanea 9: 69 (1944) my *no. 12024* is cited from Loudonville, Ashland County, Ohio, but it was actually collected at Rogersville, Holmes County. The reference is a typographic error for *no. 12171*. The *C. & W. 232* cited below from Roberts County, South Dakota, was collected on Jones Island in Big Stone Lake and may have been from Big Stone County, Minnesota, instead. The *Wright 553* cited below from Rolette County, North Dakota, was collected in the Turtle Mountains, which are 60 percent in that county and 40 percent in Bottineau County. The *Jacobs 181* and *A. S. Hitchcock s.n.* [Douglas Co., 8.7.99], cited below as *V. hastata*, were regarded as *V. urticifolia* x *hastata* and as *V. hastata* x *simplex* respectively by Gates in his Kansas Flora.

Kausch s.n. [Rostock, 1869] is a mixture with *V. officinalis*; *Clevenger s.n.* [Fletcher, Aug. 13, 1897], *A. Fitch s.n.* [East Greenwich, 1865], and *Brinton s.n.* [8.9.1878] are mixtures with *V. urticifolia*; *Van Vleet 399* is a mixture with *V. simplex*; *Eggert s.n.* [St. Louis, Aug. 8, 1875] is a mixture with x*V. engelmannii*; and *E. W. Fell 57-736* is a mixture with x*V. rydbergii*. *McVaugh 14767a* is not at all typical — its leaves resemble those of *V. urticifolia*, but the corolla is said to have been blue-violet.

The physico-chemical properties of *V. hastata* in relation to phytogeography are discussed by J. A. Harris (1934), based on his *C.27628* from the drift zone of a sandy beach on the east shore of Lake Utah, west of Provo, Utah County, Utah. The pollination of the species is discussed by H. B. & J. L. Lovell in Torreya 41: 184—187 (1939). Goss (1924) reports that he buried seeds of this species for 20 years — those buried 8 inches deep gave 82.5 percent germination, those buried 22 inches deep gave 71 percent germination, while those buried 42 inches deep gave no germination when dug up and replanted normally. Felt (1917) describes a white and pinkish gall, with a frost-like erineum and leaf-curl involving the whole plant and apparently very destructive, caused by an acarid, *Eriophyes* sp., originally published by Chadwick (1908). Hocking (1955) says that the dried aerial portion of *V. hastata* is called "verbena" in the pharmaceutical trade and is used as a diaphoretic, expectorant, tonic, and vulnerary in diabetes. A bitter glucoside called "verbenalin" is found richest in the flowers.

The following fungi have been reported as infesting *V. hastata* in the wild: *Aecidium verbenicola* Ellis & Kellerm., *Dicaeoma verbenicola* Arth., *Puccinia sydowiana* Diet., *P. verbenicola* Arth., *P. vilfae* Arth. & Holw., *Didymella rehmii* (J. Kuntze) Sacc., *Erysiphe cichoracearum* DC., *Phyllosticta verbenicola* Martin, *Septoria verbenae* Rob. (1847), and *S. verbenae* Gerard (1873).

The species was apparently first introduced into cultivation in 1748; Murray lists it as from British gardens in 1799. Bailey (1935) lists the following nurserymen and florists as offering its seeds to the trade: Bay State, L. E. Williams of Exeter, N. Y., Midwest Perennial Collectors of Stanford, Ill., George D. Aiken of Putney, Vermont, Snowberger, Buffalo City Hospital Botanic Garden, Alpine Nursery of Alpine, Tennessee, Lexington Botanic Garden of Lexington, Massachusetts, Cornamere, and Floraire. Mattoon (1958) states that it is offered to the horticultural trade by Charles H. Williams, Henderson's Botanical Gardens, Thompson & Morgan (England), and Saier (Dimondale, Michigan).

The collector, Josiah Thomas Scovell, has his surname misspelled "Scovill" in the University of Michigan herbarium. Miss Elizabeth Ann Bartholomew, in a letter to me dated March 1, 1961, states that Roy B. Clarkson's records indicate that his *nos. 272* and *1585*, from Pocahontas County, and *3109* from Randolph County, West Virginia, represent this species, but I have as yet not seen these collections.

Perry (1933) cites the following 175 additional specimens not as yet seen by me: NOVA SCOTIA: Hants Co.: *Pease & Long 22350* (G). NEW BRUNSWICK: Gloucester Co.: *Fowler s.n.* [Napisiguit, 30 July 1873] (E). York Co.: *Fernald & Pease 25247* [Nashwaak] (G). QUEBEC: Deux-Montagnes Co.: *Louis-Marie 141* (G). Saint Maurice Co.: *Chamberlain & Knowlton s.n.* [Northwest of Three Rivers, 1 Aug. 1923] (G). Sherbrooke Co.: *Knowlton s.n.* [Ascot, 20 July 1923] (G). ONTARIO: Elgin Co.: *G. L. Fisher s.n.* [Aylmer, Aug. 5, 1912] (E). Frontenac Co.: *Fowler s.n.* [Kingston, Sept. 1897] (G). Renfrew Co.: *Fowler s.n.* [Ashdod, 24 July 1893] (E). MANITOBA: *Macoun s.n.* [Muskeg Island, Lake Winnipeg, 11 Aug. 1884] (G). SASKATCHEWAN: *Bourgeau s.n.* [1857--8] (G). VANCOUVER ISLAND: *W. R. Carter s.n.* [Alberni, July 1915] (G). MAINE: Aroostook Co.: *Fernald s.n.* [St. Francis, 5 Aug. 1893] (G). Piscataquis Co.: *Fernald 296* (E, G). York Co.: *Parlin s.n.* [North Berwick, 28 Aug. 1891] (G); *Williams s.n.* [Eliot, 27 Aug. 1895] (G). NEW HAMPSHIRE: Cheshire Co.: *Robinson 196* (G); *Williams s.n.* [Walpole, 28 July 1901] (G). Coos Co.: A. H. Moore 4316 (G). County undetermined: Jesup s.n. [bank of Connt. River] (G). VERMONT: Addison Co.: Williams s.n. [Weybridge, 8 July 1908] (G). Bennington Co.: Day 149 (G). Rutland Co.: I. W. Anderson s.n. [Mechanicsville, 6 Aug. 1906] (G); D. L. Dutton s.n. [Brandon, July 7, 1921] (E). Windham Co.: Robinson 153 (G). MASSACHUSETTS: Barnstable Co.: Cheney s.n. [Centreville, 20 Aug. 1902] (G); Greenman 398 (E, G); Williams s.n. [Centreville, 6 Sept. 1896] (G). Bristol Co.: Sturtevant s.n. [Nonquit, 29 Aug. 1888] (E). Hampden Co.: Morris s.n. [Monson, July 1897] (E); F. C. Seymour 511 (E). Hampshire Co.: Robinson 572 (G). Middlesex Co.: Faxon s.n. [Jamaica Plain] (G); Lane s.n. [Waverly, 10 Aug. 1878] (G); Morong s.n. [Melrose, 17 July 1876] (E); Sturtevant s.n. [South Framingham, 11 Aug. 1888] (E). Norfolk Co.: Williams s.n. [Dedham, 6 Oct. 1901] (G). Martha's Vineyard: F. C. Seymour 1324 (G). RHODE ISLAND: Providence Co.: Collins s.n. [Providence, 16 July 1892] (G); Olney s. n. [Providence] (G). Block Island: Fernald & Long 10263 (G). CONNECTICUT: Hartford Co.: Andrews s.n. [Southington, 31 July 1898] (G); Bissell s.n. [Southington, 10 Aug. 1897] (E). New Haven Co.: Eaton s.n. [New Haven, 1858] (E); Harger s.n. [Oxford, 11 Aug. 1888] (G). Tolland Co.: Weatherby 5076 (E). NEW YORK: Delaware Co.: Von Schrenk s.n. [Fleischmann's, 15 July 1892] (E). Essex Co.: Von Schrenk s.n. [Keene Valley, 1 Aug. 1891] (E). Queens Co.: Hexamer & Maier s.n. [Willets Neck, L. I., 8 Aug. 1853] (G). Saint Lawrence Co.: Mrs. O. P. Phelps 799 (G). Suffolk Co.: Von Schrenk s.n. [Peconic, 15 Aug. 1895] (E). Tompkins Co.: Dean & Thomas 4874 (G); MacDaniels 4873 (G). Washington Co.: J. A. Drushel 6351 (E). Westchester Co.: Stabler s.n. [Port Chester, 3 Sept. 1886] (G). NEW JERSEY: Middlesex Co.: J. A. Kelsey 173 (G). Union Co.: Trelease s.n. [Plainfield, 9 Aug. 1877] (E). PENNSYLVANIA: Dauphin Co.: J. K. Small s.n. [near Harrisburg, 13 July 1888] (G). Perry Co.: A. A. Heller 14222 (E). Philadelphia Co.: Greenman 1273 (G); Redfield s.n. [Fairmont Park, 22 July 1871] (E). DELAWARE: New Castle Co.: Tidestrom 11551 (G). MARYLAND: Harford Co.: Shull 156 (E). Howard Co.: Arsène 672 (E). DISTRICT OF COLUMBIA: I. Blanchard s.n. [11 July 1891] (E). VIRGINIA: Elizabeth City Co.: W. Palmer s.n. [Langley, 10 Aug. 1901] (W). Smythe Co.: J. K. Small s.n. [July 30, 1892] (E, G). WEST VIRGINIA: Barbour Co.: A. H. Moore 2569 (G). Pocahontas Co.: Berkley 1304 (E). Woods Co.: Pollock s.n. [7 Aug. 1897] (E). FLORIDA: Franklin Co.: A. W. Chapman s.n. [Apalachicola] (E). OHIO: Cuyahoga Co.: Greenman 1377 (E), 1379 (E, G), 1382 (E). Portage Co.: Webb 5441 (G). County undetermined: Riehl s.n. [dry places, July] (E). ILLINOIS: Cass Co.: Geyer s.n. [Beardstown, July 1842] (E). Champaign Co.: H. A. Gleason 1945 (G). Cook Co.: Greenman 1953 (E); H. H. Smith 5654 (G); Steele 106 (E). Kankakee Co.: Sherff

1649 (E). Pike Co.: Davis 3565 (E). Saint Clair Co.: Engelmann s. n. [banks of the Mississippi, opposite St. Louis, July 1842] (E). INDIANA: Lake Co.: Lansing 2805 (G). IOWA: Boone Co.: L. H. Pammel 1806 (E). Decatur Co.: J. P. Anderson s.n. [July 13, 1903] (E). Poweshiek Co.: M. E. Jones s.n. [Grinnell, Aug. 1877] (E, G). Story Co.: Bessey s.n. [Ames, Sept. 1873] (G); L. H. Pammel 78 (E). TENNESSEE: Carroll Co.: Eggert s.n. [Hollow Rock, 5 Aug. 1897] (E). McNairy Co.: S. M. Bain 444 (G). MICHIGAN: Berrien Co.: Lansing 3241 (G), s.n. [New Buffalo, 20 July 1911] (G). Emmet Co.: F. C. Gates 10708 (E). Marquette Co.: Barlow s.n. [Turin, 9 July 1901] (G). Van Buren Co.: Lansing 3340 (G). WISCONSIN: Buffalo Co.: Fassett & Hotchkiss 3322 (G). Sauk Co.: Eggert s.n. [near Mirror Lake, July 1903] (E). Shawano Co.: E. J. Palmer 28738 (E). MINNESOTA: Becker Co.: M. L. Grant 3073 (E, G). Hennepin Co.: Ballard s.n. [Swan Lake, July 1892] (G). Stearns Co.: Chandonnet s.n. [Collegeville, 29 July 1912] (E). NORTH DAKOTA: Benson Co.: Lunell s.n. [peninsula of Lake Ibsen, 1 Aug. 1899] (G). Grand Forks Co.: Brannon 128 (E). Richland Co.: H. F. Bergman 2335 (E). SOUTH DAKOTA: Brookings Co.: Johnson s.n. [Oakwood Lakes, 27 July 1903] (E); Thornber s.n. [Brookings, 1 Aug. 1893]. Kingsbury Co.: Thornber s.n. [Iroquois, 9 Aug. 1894] (G). Sanborn Co.: Visher 4439 (E). KANSAS: Johnson Co.: A. S. Hitchcock s.n. [Olathe, Aug. 1892] (E). Osborne Co.: Shear 202 (G). Reno Co.: White 174 (E). Riley Co.: J. B. S. Norton 390 (E, G). MISSOURI: Clark Co.: B. F. Bush 9165 (E). Jackson Co.: B. F. Bush 2214 (E). Jasper Co.: E. J. Palmer 197 (E), 198 (E), 1085 (E), 10568 (E); Trelease 716 (E). Marion Co.: J. Davis 3192 (E), 3578 (E), 3590 (E), 3817 (E). Saint Louis: Eggert s.n. [St. Louis, 12 Aug. 1877] (E, Po); Engelmann 337 (E), s.n. [near St. Louis, Sept. 1841] (E), s.n. [St. Louis, Aug. 1861] (G); Kellogg 1131 (E), s.n. [Allenton, 18 June 1896] (E); Lindheimer s.n. [St. Louis, July 1839] (E). IDAHO: Ada Co.: J. A. Clark 253 (E, G). Canyon Co.: Macbride 304 (E). WYOMING: Sheridan Co.: A. Nelson 2258 (E, G), 8439 (E). UTAH: Salt Lake Co.: Pammel & Blackwood 3638 (G). COLORADO: Adams Co.: E. L. Johnson 507 (E). Denver Co.: Eastwood 41 (E, G). Fremont Co.: Brandegee s.n. [Canon City, 1872] (E). Larimer Co.: Crandall 2014 (G). NEBRASKA: Howard Co.: Bates s.n. [St. Paul, 24 July 1909] (G). Lancaster Co.: H. J. Webber s.n. [Lincoln, 9 July 1885] (E). Nuckolls Co.: Hedgcock s.n. [Aug. 1899] (E). Thomas Co.: Rydberg 1515 (G). County undetermined: Hayden s.n. [Dickson's Bluffs on the Missouri, 12 July 1853] (E). OKLAHOMA: Ellis Co.: G. W. Stevens 2901 (G). Grant Co.: G. W. Stevens 1791 (E, G). Harper Co.: Stratton 400 (E). TEXAS: Oldham Co.: Ferris & Duncan 3513 (E). NEW MEXICO: County undetermined: C. Wright 1498 (D, GO. ARIZONA: Yavapai Co.: Coues & Palmer 279 (E). WASHINGTON: Okanogan Co.: Elmer 537 (E). Stevens Co.: Kreager 469 (G). Walla Walla Co.:

Savage, Cameron, & Lenocker s.n. [Walla Walla, July 1898] (E). Yakima Co.: Brandegee s.n. [Yakima region, 1882] (E); Cotton 1396 (G). OREGON: Marion Co.: J. C. Nelson 1804 (G). Multnomah Co.: T. Howell 292 (G); E. P. Sheldon 11167 (E, G). Umatilla Co.: Leiberg 2630 (G). She says "This rather distinct species shows a tendency to blend with several members of the Verbenaca in the region of the Middle States. Some botanists have regarded the variability in the compactness and the profusion of the inflorescence, as well as the tendency of the leaves to develop hastate lobes near the base, as being of nomenclatural value. Unfortunately in the rather complete series of specimens at hand, the writer has not found any combination of characters varying greatly in one direction; and, at the present time, sees no reason to maintain other than the specific category."

In all, 2409 herbarium specimens, including the type collections of almost all the names involved, and 12 mounted photographs of this species have been examined by me.

Citations: NOVA SCOTIA: Cumberland Co.: Schofield 4235 (Vi). Kings Co.: D. H. Webster 79 (Vi). Pictou Co.: C. B. Robinson 521 (N). NEW BRUNSWICK: Carleton Co.: Dore & Gorham 45854 (Rf, Vi, W—2034268); Slipp s.n. [July 10, 1952] (Vi). QUEBEC: Argenteuil Co.: B. J. Harrington s.n. [St. Andrews] (Mm); W. B. McConnell s.n. [Chatham, June 29, 1870] (Mm—22305). Assomption Co.: Louis-Marie, Dudemaine, & Laporte 1151 (Du—283367); Tardif 18 (Vi). Beauce Co.: Anselme 344 (Um—227). Chambly Co.: Marie-Victorin 910 (Vi—86), 8328 (Vi), 8940 (Vi), 9622 (In, Um—222, Vi), s.n. [Longueuil, Sept. 1915] (W—872570); Morin 206 (Vi). Deux-Montagnes Co.: Louis-Marie 24156 (Um—221); Major-Barnabé 1030 [18 Sept. 1940] (Vi). Gatineau Co.: Jenkins, Bayly, & Turnau 3306 (Bm). Hochelaga Co.: Lanouette s.n. [St. Henri, 12-7-32] (Um—214). Jacques Cartier Co.: Degener & Degener 26129 (N); Herb. Mus. Coll. St. Laurent s.n. [Montreal, Juil. '90] (Vi); Kucyniak 56 (Vi); Major-Barnabé 1030 [24 aout 1940] (Vi); Massicotte s.n. [Montreal, juillet 1899] (Vi); Rouleau 1075 (Um—256), 2062 (Um—257); E. Roy 3001 (Vi). Montmagny Co.: Marie-Victorin, Rolland-Germain, Rousseau, & Meilleur 40025 (Um—213). Papineau Co.: Ross & Rouleau 1 (Um—228). Richmond Co.: N. K. Berg s.n. [Danville, Aug. '94] (C); Redpath s.n. [Melbourne, July 1872] (Mm—4649). Rouville Co.: Gilles 25700 (Um—226). Saint Maurice Co.: Stanislas 602 (Um—217, Um—218, Um—219). Shefford Co.: Fabius 409 (Vi); Laurent 19 (Vi). Sherbrooke Co.: Doucet & Beaulieu s.n. [Sherbrooke, 15 aout 1955] (Ca—72391); Herb. Montreal Nat. Hist. Soc. s.n. [Ascot, 1850] (Mm—22632). Terrebonne Co.: Meilleur 560 (Mg). Trois Rivierès Co.: F. Joseph s.n. [Aout 1925] (Vi—88). Vaudreuil Co.: E. Roy 2367 (Vi), 3312 (Vi), 3318 (Vi, Vi, Vi), 3333 (N, Vi, W—2096467), 3847 (Vi), 4034 (Vi, Vi). Ile des Soeurs [Verdun Co.]: Vincent s.n. [Eté 1942] (Vi). County undetermined: A. F. Holmes s.n. [below

Quesnel's] (Mm—359); C. C. Stewart s.n. [Brownsburg, June 23rd 1891] (Dt). ONTARIO: Algoma Dist.: Grassl 5926 (Mi); Prettyman 904 (Bt—40264). Bruce Co.: R. Campbell s.n. [Chesley] (Mm—20481); Krotkov 9347 (N, N, W—1652593). Carleton Co.: Calder 3246 (Ca—882650); Macoun 81042 (Cm); Rolland-Germain 6168 (Vi), 6193 (Or—13555). Elgin Co.: G. L. Fisher s.n. [Aylmer, Aug. 5, 1912] (Ur), s.n. [St. Thomas, Aug. 1, 1908] (B). Essex Co.: Lenander s.n. [Windsor, Aug. 21, 1933] (S); B. H. Patterson s.n. [Windsor, July 12, '86] (Cm). Frontenac Co.: J. Fowler s.n. [Kingston, July 31, 1897] (W—605753). Grey Co.: Mauger 82 (Vi). Huron Co.: Grassl 5906 (Mi). Kenora Co.: Buller s.n. [Kenora, July 1918] (Wp, Wp), s.n. [Kenora, Sept. 1918] (Wp), s.n. [Minaki] (Wp). Lambton Co.: Gaiser 490 (Gp, Gp, Gp, Mm), 1615PE (Gp, Gp, Gp, Mm), 1763PE (Gp, Gp, Gp, Mm), 2367RG (Gp, Mn); Gaiser & al. 490G (Gp). Leeds Co.: M. Edmondson s.n. [11.VII. 1898] (N); Marie-Victorin, Rolland-Germain, Rouleau, & Raymond 56833 (Vi), 56851 (Vi). Middlesex Co.: W. Dearness 80 (Mg), 85 (Mg). Perth Co.: Shields 185 (Vi). Prescott Co.: Dunbar 67 (Go); Rouleau 134 (Um—49230). Stormont Co.: L. Jenkins 8269 (Hi—186971). Wentworth Co.: Hoodless s.n. [Hamilton] (Se—14936). York Co.: R. F. Cain 281 (Bt—16552); Mauger 4m (Vi). Georgian Bay Island E.9: E. D. McDonald Jr. 254 (W—1888624). Toronto Island: C. W. Armstrong s.n. [Aug. 20, 1892] (W). Walpole Island: Gaiser 1522W (Gp, Gp, Gp, Mm), 2391 (Gp, Gp, Mm). Wolf Island: J. Fowler s.n. [July 1, 1895] (W—261035). County undetermined: T. W. Edmondson 2585 [Haley's Station] (N); J. Fowler s.n. [Almonte, July 7, 1898] (W—430868); A. Gray s.n. [Rochester] (S). Manitoulin Island: Grassl 5924 (Mi). MANITOBA: Lisgar Co.: E. W. Hart 4 (N). County undetermined: Kaminski s.n. [Gimli] (Wp); Leach s.n. [Caddy Lake] (Wp); C. W. Lowe s.n. [Grand Beach] (Wp, Wp). SASKATCHEWAN: Assiniboia: Boivin & Dore 8000 (N). Wadenai: S. E. Clarke s.n. [July '39] (Sk). District undetermined: Bourgeau s.n. [1857—8] (S). BRITISH COLUMBIA: Yale Co.: W. B. Anderson s.n. [Aug. 8, 1917] (Pl—45404). County undetermined: J. Fletcher 1303 [Kelowna] (Mg). VANCOUVER ISLAND: J. R. Anderson s.n. [21 Aug. 1905] (Pl—45521, Pl—45522); W. R. Carter s.n. [Alberni, July 1916] (I), s.n. [Alberni, Sept. 1916] (Po—179931); Macoun s.n. [Aug. 12th 1887] (C). MAINE: Androscoggin Co.: E. D. Merrill 757 (W—414487). Aroostoock Co.: G. D. Chamberlain s.n. [Washburn, Sept. 2, 1940] (Ca—882649); Fernald s.n. [Aug. 5, 1893] (S); True 6250 (Up); E. P. Walker 1364 (Up). Cumberland Co.: E. B. Chamberlain s.n. [Cumberland, 1 Aug. 1901] (W—491252); H. N. Moldenke 18898 (Es, N, Or, Se, Si, Up). Hancock Co.: Strobel s.n. [Blue Hill, 1892] (Um—234). Oxford Co.: F. W. Johnson 248 (N); True 1474 (Up). Penobscot Co.: Harvey & Harvey 757 (W—606267); Hiland s.n. [above Old Town, VII-23-1929] (La), s.n. [n. of Orono, VII-23-1929] (La); L. P. Hynes

1371 (Up). Piscataquis Co.: Fernald 296 (C, W--278475). Waldo Co.: Friesner 9092 (Bt--27853, Bt--27854). York Co.: Cléonique-Joseph 2954 (Vi); F. T. Hubbard s.n. [Seabury, Aug. 15, 1901] (Rf); Parlin 1372 (Hi--22995); True 275 (We), 2756 (Up). NEW HAMPSHIRE: Belknap Co.: True 290 (Up). Carroll Co.: Pierce s.n. [August 19, 1889] (Du--24182). Cheshire Co.: Ottley 5750 (Go). Coos Co.: A. H. Moore 4062 (Up); Pease 35A60 (Hi--199501). Grafton Co.: Bowen 435b (Up); W. V. Brown 1928 (H--63336); C. H. Hitchcock s.n. [Hanover] (Dt); Langdon s.n. [Campton, July 25, 1893] (Mi). Hillsboro Co.: Batchelder 2113 (Dt); H. N. Moldenke 19024 (Es, N, Or, Ot, Se, Si, Sm, Up). VERMONT: Bennington Co.: M. A. Day 149 (Vt, W--348488). Caledonia Co.: F. Blanchard s.n. [Barnet, July 1884] (Ca--192068), s.n. [Barnet, Aug. 1886] (Dt); Grover s.n. [July 24, 1890] (Ob--50799). Chittenden Co.: Core, Frye, & Core 4811 (We); Dole 111 (Vt), 501 (Vt); F. A. R. s.n. [Burlington, July 23, '03] (Vt); Grout s.n. [Burlington, July 24, '91] (Vt); Herb. Univ. Vermont s.n. [Burlington, July 7, 1907] (Vt); Pringle s.n. [Essex, 18 August 1876] (Vt), s.n. [Charlotte, 29 August 1878] (Vt). Franklin Co.: Pease 38488 (Hi--199242). Orange Co.: J. F. Reed s.n. [Fairlee, Oct. 22, 1931] (H-27587). Rutland Co.: Banker 280 (N); Carpenter s.n. [8/13/05] (Vt), s.n. (La); D. L. Dutton s.n. [Brandon, Aug. 10, 1910] (Vt), s.n. [Brandon, July 7, 1921] (Cm), s.n. [Brandon, July 9, 1921] (Um--221, Va); Eggleston s.n. [Rutland, 8-90] (Dt); Osborn s.n. [Pittsford, July 20, 1880] (Pu). Windham Co.: H. N. Moldenke 9886 (Ur); Moldenke & Moldenke 9886 (Go, N). Windsor Co.: F. Blanchard s.n. [W. Windsor, 1873] (Dt); Chivers & Poole s.n. [Norwich, 7/19/39] (Go); Loveland s.n. [Norwich, 7-28-1875] (Vt); Roller s.n. [Plymouth, 7/15/36] (Nj). County undetermined: E. Brainerd s.n. [10 Aug. 1879] (Vt); Collector undesignated s.n. [Lk. Champlain, Aug. 17, 1881] (Vt); Dike s.n. [August] (Vt); Herb. Univ. Vermont 9589-17 (Vt). MASSACHUSETTS: Barnstable Co.: Beetle 534 (Pl--81424); Fernald 669 (W--1885809); Fernald & Long 19032 (Al); Fogg 563 (Up--82439), 3593 (Up, Up); J. P. Poole s.n. [Mashpee, 8/18/39] (Go). Berkshire Co.: Churchill s.n. [Lanesboro, July 19, 1915] (Ba); Herb. Torrey s.n. [July 1828] (T); Jones & Jones 15344 (Ur); Moldenke & Moldenke 11673 (Go, N); C. L. Pollard s.n. [Great Barrington, Aug. 1893] (W--309645). Bristol Co.: O. Ames s.n. [North Easton, July 28, 1893] (Rf); Blomberg s.n. [August 1903] (S). Dukes Co.: Fogg 2465 (Up); F. M. Jones s.n. [August 17, 1940] (Up); F. C. Seymour 1324 (H--107712). Essex Co.: J. Blake s.n. [8.1882] (S); Chivers s.n. [Amesbury, July 7, 1902] (Dt, Dt, Dt); S. S. Clark 263 (La), 263a (La); A. H. Moore 121 (Io--131755); Morong s.n. [Jul. 28, 1868] (N); K. L. Powell s.n.

[Ipswich, Aug. 1, 1921] (Sd—5965). Franklin Co.: H. N. Moldenke 8846 (N); R. E. Torrey s.n. [July 20, 1910] (Ms). Hampden Co.: R. H. Piper 1341 [Dorwart or Herb. Amherst Coll. 68337] (Ok); F. C. Seymour 511 (H—107713, Ms, N). Hampshire Co.: Barlow s.n. [Amherst, July 11, 1905] (Ms); A. Clark s.n. [Amherst, August 1875] (Ms); Ewer s.n. [Amherst, 7/11/28] (Ms, Ur); Goodale s.n. [North Hadley, 31 July 1926] (H—107715); Jesup 1956 (Dt); Peabody s.n. [Amherst, July 1874] (Sd—4253); C. S. Plumb 395 (Ms); F. C. Seymour 2869 (H—107714); R. E. Torrey s.n. [Amherst, 8-22-11] (Ms). Middlesex Co.: H. H. Bartlett 242 (Mi); F. S. Beattie 14409 (Es), s.n. [Aug. 8, 1927] (Or—20970), s.n. (Po—146577); A. H. Clark 160 (Gg—31327); Cushman s.n. [Middlesex Fells, July '89] (Up—69671); W. Deane s.n. [Aug. 31, 1912] (Dt); G. B. Grant 6111 (Po-267625); Grover s.n. [July 26, 1895] (Ob—50793); F. C. Seymour s.n. [Waverley, July 24, 1908] (H—107716). Suffolk Co.: Blazic s.n. [July 1922] (Gg—31329); Boot s.n. [Boston, 1816] (S); Churchill s.n. [Dorchester, Oct. 1, 1898] (Ba); Girard s.n. [Cambridge, aout '48] (Bm); E. L. Greene s.n. [Boston, 25 aout 1833] (Du—166435). Worcester Co.: W. V. Brown 3083 (Au); W. F. Carr s.n. [West Sterling] (Se—14937); Hathaway 681 (S); R. H. Piper 524 (Ok), 1177 (Ok). Martha's Vineyard: MacKeever MV.402 (Gg), MV.402a (Gg); F. C. Seymour 1324 (N). Nantucket Island: E. P. Bicknell 7339 (N), s.n. [Sep. 2, 1904] (N); MacKeever N.286 (N, Um, Z). Uneatena Island: D. S. Francis 37 (Ok). County undetermined: J. Lund s.n. [Edgeworth, Aug. 11, 1882] (Ok); J. Torrey s.n. [1833] (Br). RHODE ISLAND: Kent Co.: H. N. Moldenke 19038 (B, Es, F, Fy, Mg, Mr, N, No, Or, Ot, S, Se, Si, Sm, Ss, Up). Block Island: P. Spaulding s.n. [Block Island, Aug. 9, 1916] (Gg—31323, W—1118326). County undetermined: A. Gray s.n. [1848] (S). CONNECTICUT: Fairfield Co.: J. H. Barnhart 54 (N); Bisaillon 70 (Um—51566); S. C. Brooks s.n. [Greenwich, August 25, 1908] (Ca—377695); Jesup s.n. [Westport, Aug. 1850] (Dt); C. L. Pollard 186 (W—309642); P. Wilson seed 347 (N). Hartford Co.: M. Brandegee s.n. [Berlin] (Ca—468124); H. C. Cowles s.n. [Sept. 13, 1892] (Ob—50794). Litchfield Co.: J. Dwyer 2388 (N); Meredith s.n. [Aug. 2, 1927] (S). Middlesex Co.: W. R. Hunt s.n. [Essex, July 15, 1922] (Au). New Haven Co.: W. W. Denslow s.n. [New Haven] (Ms); Kleeberger s.n. [New Haven, July 1874] (Gg—31331); J. W. Wood s.n. [July 1864] (Ms). New London Co.: Jansson s.n. [Sept. 10, 1927] (S), s.n. [Groton, July 16, 1929] (Go), s.n. [Groton, July 18, 1929] (Au), s.n. [Groton, July 28, 1929] (Ew), s.n. [Groton, Aug. 20, 1929] (Um—223), s.n. [Lyme, Aug. 18, 1957] (Go); K. P. Jønsson s.n. [Groton, July 17, 1928] (Io—135364); Lumsden s.n. [Aug. 7, 1884] (Ob—50801); W. A. Setchell s.n. [Norwich, July 10, 1883] (Ca—25183). Windham Co.: J. L. Sheldon s.n. [Central Village, June 1903] (We). County undetermined: Herb. Gray s.n. (S); C. Wright s.n. (Cm). NEW YORK: Albany Co.: H. D. House 19599 (Al); Whitney 654 (Al), 1097 (Up). Bronx Co.: Ahles 505 (Aa), 777 (Aa); E. P. Bicknell 7341 (N), 7341a (N), 7342 (Al), 7344 (N), 7346 (Nj); Clute s.n. [Bronx Park, July 21, 1898] (Bt—22923), s.n. [Pelham Park, July 12, 1899] (N); Gilly 105 (N); Holtzoff s.n. [McLean's Wood] (N); L. Johnson s.n. [Wmsbridge, Aug. 1, 1876] (Lh). Cattaraugus Co.: Alexander & House 12481 (Al), 13005 (Al). Chautauqua Co.: G. B. Grant 530 [3059] (Po—267672); Southworth s.n. [Forestville, Aug. 17, 1885] (Mi). Chemung Co.: Munz 173033 (S). Chenango Co.: E. E. Davis 6 (Al), 82 (Al), 129 (Al), 1028 (Al), 1088 (Al), 1119 (Al). Clinton Co.: Whitney 1994 (Al). Columbia Co.: McVaugh 1407 (Al, Up), 14767a (Mi); Moldenke & Moldenke 11745 (N), 19527 (Sm); C. H. Peck s.n. [Boston Corners] (Al); W. A. Weber 1414 (Bl—48178, Io—152915). Cortland Co.: A. R. Moldenke 1 [H. N. Moldenke 20416] (N); C. H. Peck s.n. [Marl Pond] (Al). Delaware Co.: Ferguson, Ennis, & Ottley 2685 (Me), s.n. [Ottley 2685] (Io—127769); Ottley 2685 (Me); N. Taylor 792 (N); P. Wilson s.n. [Arkville, July 18, 1915] (Al, N). Dutchess Co.: B. Sherwood s.n. [road to Wingdale, Aug. 7] (Sh, Sh, Sh); Standley & Bollman 11943 (W—895512). Erie Co.: G. W. Clinton s.n. [Buffalo] (Pr); Mellor & Shafer 1066 (Cm). Essex Co.: Bowen 126b (Up); Britton & Britton s.n. [Sept. 15th, 1900] (N); H. D. House 15156 (Al), 28243 (Al); Wilde s.n. [Hurricane, 8/15/37] (Nj). Fulton Co.: W. D. Day s.n. [Stratford, Aug. 1871] (Pa). Genesee Co.: Muenscher & Brown 21403 (It). Greene Co.: N. Taylor 1020 (N), 1184 (N). Herkimer Co.: Folwell 512 (It); W. H. Rhoades s.n. [Little Falls] (Hs). Jefferson Co.: Keyes s.n. [Watertown, July 1889] (Ca—199029); Muenscher & Maguire 2500 (Ca—513006); True 926 (Up). Kings Co.: Ruger s.n. [East Williamsburgh] (Tc). Lewis Co.: Hotchkiss 871 (Al). Madison Co.: Haberer 2748 (W—1200262); Maxon s.n. [near Breese's Woods, July 26, 1895] (W—674569). Monroe Co.: Barss s.n. [Rochester, 7 September 1909] (Or—8862); Holger s.n. [July 1863] (Al); W. A. Matthews 3154 (Hi—29791, La); A. R. Moldenke 8 [H. N. Moldenke 20436] (N, No); W. H. Rhoades s.n. [Rochester, Aug. 1934] (N). Nassau Co.: W. C. Ferguson 7145 (N), 7194 (N). Niagara Co.: Frazier s.n. [Niagara Falls, Aug. 1915] (Io—76670); E. C. Townsend s.n. [July 25, 1891] (Pl—86887). Oneida Co.: Haberer 677 (Al), 2747 (Al); H. D. House s.n. [July 13, 1916] (Al), s.n. [Aug. 17, 1917] (Al). Onondaga Co.: G. T. Hastings s.n. [Tully, July 24, 1895] (N); Straub s.n. [p. Syracuse] (W—317094). Ontario Co.: A. R. Moldenke 6 [H. N. Moldenke 20434] (Mr, N). Orange Co.: H. M. Denslow s.n. [Goshen] (N); Raup 7656 (Mi, N). Orleans Co.: Lennon s.n. [July 1893] (Al). Oswego Co.: Hotchkiss 3059 (Al); O. E. Pearce s.n.

[N. Hannibal, July 5, 1884] (W—147577); C. S. Sheldon s.n. [July 20, 1878] (Al). Otsego Co.: F. W. Johnson s.n. [Cherry Farm, Aug. 27, 1921] (N). Putnam Co.: H. N. Moldenke 19530 (Ot); Moldenke & Moldenke 11853 (N). Queens Co.: W. C. Ferguson 7732 (N); Hexamer & Maier s.n. [Willet's Neck, L. I., July 9, '53] (Cm). Rensselaer Co.: Banker 1395 (N); Puissant s.n. [West Troy, July 28, 1865] (Br), s.n. [Troy] (Br, I). Richmond Co.: Hollick s.n. [July 15th 1879] (Tc). Rockland Co.: Lucian 348 (Wl). Saint Lawrence Co.: Muenscher & Maguire 1092 (Ua—11387); Mrs. O. P. Phelps 799 (Gg—31324). Saratoga Co.: Collector undesignated 340 (Cm), s.n. [Saratoga Springs, 7/12/95] (Lh); H. D. House 13285 (Al). Schenectady Co.: H. N. Moldenke 19522 (Es). Schoharie Co.: H. N. Moldenke 19518 (Es). Schuyler Co.: McCarthy s.n. [Watkins, July 1887] (W—147575), s.n. [Watkins, Aug. 1887] (W—219417). Steuben Co.: A. R. Moldenke 11 [H. N. Moldenke 20460] (N). Suffolk Co.: Benson 7286 (Po—267627); S. L. Clarke s.n. [Quegue] (N); Disbrow s.n. [East Hampton] (Nm); H. W. Graham s.n. [Deer Pond, July—Aug. 1926] (Cm); L. K. Henry s.n. [Deer Pond, July 1929] (Cm), s.n. [Long Pond, July 1929] (Cm); Latham 38 (Al); Muenscher & Curtis 6430 (Al); C. Skottsberg s.n. [Montauk, 10/8/1926] (Go). Sullivan Co.: Eiten & Jensen 1463 (N); W. A. Weber 208 (Bl—48179, Io—150795). Tioga Co.: A. R. Moldenke 2 [H. N. Moldenke 20420] (N). Tompkins Co.: L. H. Bailey s.n. [Ithaca, Apr. 10, 1919] (Ba), s.n. [Ithaca, July 27, 1925] (Ba, Ba, Ba); Hoisington 47 (Ok—15640), 160 (Ok—15659); H. S. Jackson s.n. [McLean, July 2, 1904] (H—107717); J. M. R. s.n. [July 15, 1926] (Gu—E.1051); M. T. Lee s.n. [Enfield, July 1898] (N); Lennon s.n. [July 23, 1896] (Al); Locke s.n. [Fall Creek, Sept. 19th, '79] (Fc), s.n. [Ithaca, Sept. 25th, '79] (Fc); B. Maguire 6662 (Ua—26812); A. R. Moldenke 3 [H. N. Moldenke 20426] (Mg, N), 5 [H. N. Moldenke 20428] (N); Muenscher & Bechtel 340 (Ba, Io—113450, Pl—62605); Munz 617 (Po—64682); E. L. Palmer 1016 (S); O. E. Pearce s.n. [Ithaca, July 28, 1885] (W—218874); H. E. Summers s.n. [near Ithaca] (Io—73663); K. M. Wiegand s.n. [Ithaca, July 24, '96] (Se—36931); Woglum s.n. [Ithaca Flats, July 22, 1904] (Po—218028, Po—218029, Po—219333). Ulster Co.: Elting 2071 (Al); Macfarlane s.n. [Phoenicia Valley] (Up—46487). Warren Co.: Margolin 84 (We). Washington Co.: S. H. Burnham s.n. [August 1912] (Al); Dobbin 192 (Al); J. A. Drushel 6351 (Ur); A. Fitch s.n. [East Greenwich, 1865] (Mi), s.n. [East Greenwich, 1867] (Mi); H. D. House 29386 (Al, Ok); Jelliffe s.n. [Huletts, July '87] (C). Wayne Co.: H. N. Moldenke 20449 (N). Westchester Co.: E. P. Bicknell 7340 (Al, N); Collector undesignated s.n. [Tarrytown, Aug. 3, '96] (N); H. A. Gleason Jr. 1452 (Go, N, S); Mackaness s.n. [July 20, 1937] (Tl); H. N. Moldenke 19091 (N, Or); F. W. Pennell 6681 (N). Wyoming Co.: Herb. Univ. Ill. s.n. [Wyoming, Aug. 4, 1859] (Ur). Yates Co.: A. R. Moldenke 10 [H. N. Moldenke 20448] (N, S); W. S. Phillips 221 (Al); S. H. Wright s.n. (Mm—15403). County undetermined: Brourme s.n. [1848] (S); Collector undesignated s.n. [July 15, 1896] (N), s.n. [August 25, 1896] (N); F. C. Ferguson s.n. [Plattsdale, L. I., 7-18-19] (N); J. M. R. s.n. [Renwick, July 26, 1926] (Gu—E.1050); Ottley 16594 (Kr); Ruger s.n. (Tc); J. Torrey 746 (Al, Al), s.n. (Pa). NEW JERSEY: Atlantic Co.: H. N. Moldenke 21876 (Fg); W. Stone 12057 (Up). Bergen Co.: Dautun s.n. [Fairview, Aug. 2, 1903] (La); G. T. Hastings s.n. [Forest View Landing, Sept. 5, 1917] (N); K. D. Kimball s.n. [Moonachie, Aug. 12, 1916] (N); Niederer s.n. [Carlstadt, July 26, 1883] (N); Rydberg s.n. [Ft. Lee, July 30, 1921] (Po—174819, Um—203); Walter s.n. [Ridgefield, July 27, 1879] (N). Burlington Co.: Fogg 9212 (Up); H. A. Green s.n. [Medford, 1881] (Cm); W. Stone 12935 (Up). Camden Co.: Fogg 9200 (Up); L. P. Hynes 1439 (Up), s.n. [July 15, 1937] (Up); C. F. Parker s.n. [1860] (Pr); E. S. Steele 98 (W—1521027). Cape May Co.: Fender 809 (Up); Fogg 9406 (Up); G. B. Grant s.n. [Ocean City, 16 July '05] (Po—267673); W. Stone 10205 (Up), 10330 (Up), 11866 (Up), 16314 (Up). Cumberland Co.: W. Stone 13251 (Up). Essex Co.: Lighthipe s.n. [Upper Montclair, Aug. 13, 1914] (Au). Gloucester Co.: Brinton s.n. [Westville, July 29, 1888] (Up—17104); Fogg 9442 (Up); Lippincott s.n. [Richardsons, Sept. 1889] (Up), s.n. [Richardsons, 8-30-91] (Up). Hudson Co.: Kearney s.n. [New Durham, Aug. 24, 1894] (C); J. Torrey 125 (W—264611); Von Rabenau s.n. [Herb. Osten 13023] (Ug). Hunterdon Co.: H. L. Fisher s.n. [Stockton, 7-18-97] (Ur). Mercer Co.: Collector undesignated s.n. [Princeton, 2 Aug. 1876] (Pr); Macloskie s.n. [Princeton] (Pr). Middlesex Co.: J. A. Kelsey 173 (Mi, Ua--11386, Ua--27138, We), s.n. [Halsted 173] (C, Fc, Io—15348, Vt); H. N. Moldenke 19141 (Or); J. A. Small s.n. [Cheesequake, 7/24/39] (Nj); Thais s.n. (Mt); Vail s.n. [New Brunswick, July 18th, 1890] (N). Monmouth Co.: Brinton s.n. [Sea Girt, Aug. 27, 1891] (Ca—25181); Dautun s.n. [Cherry Hill, 2 Aout 1908] (La); H. N. Moldenke 21731 (Sm). Morris Co.: G. V. Nash s.n. [Sept. 5, 1898] (N); True 758 (Up), 2246 (Up). Ocean Co.: Fogg 11064 (Up), 11114 (Up), 11166 (Up); Harshberger s.n. [Seaside Park, July 21, 1900] (Up—43614); L. P. Hynes s.n. [September 11, 1938] (Up); J. A. Small s.n. [Island of Long Beach, 13 Sept. 1936] (Nj). Passaic Co.: Disbrow s.n. [Greenwood Lake, July '08] (Nm); H. N. Moldenke 21878 (Fg); G. V. Nash s.n. [Clifton, Sept. 4, 1892] (Ka, Lh). Salem Co.: Adams & Adams 1708 (Up); Fogg 7463 (Up), 9566 (Up). Somerset Co.: H. N. Moldenke 1339 (E, Go, H—5471, N, N, S, Up, Ur), 2061 (N), 7400 [Pl. Vic. N. Y. City 40]

(Go, N, Um—232, Ur), 8090 (Go, N, S), 20308 (Wh); Shetler 292/1 (N); Sumner s.n. [Bernardsville, Aug. 17, 1897] (Bl—42324). Sussex Co.: Adams, Adams, & Wherry 1521 (Ca—588546); Fogg 12535 (Up); Lisi 185 (Up); K. K. Mackenzie 833 (N); H. N. Moldenke 21551 (Ss); G. V. Nash s.n. [July 16, 1909] (N); H. H. Rusby s.n. [Franklin, July 26, 1873] (Mi), s.n. [Franklin, Aug. 1879] (Mn—16086); Witte s.n. [Aug. 9, 1932] (Up). Union Co.: P. Clarke s.n. [Great Island, Aug. 2, 1902] (N, N); Kezer s.n. [8/6/36] (N). County undetermined: Harshberger s.n. [New Jersey, July 1889] (Up-2153); Paddock s.n. [1838] (Ur); O. E. Pearce s.n. [N. J., 1884] (W—218873); W. Stone 3467 [Cateksin Camp] (Up); J. W. Wood s.n. [Aug. 1842] (Ms). PENNSYLVANIA: Allegheny Co.: Bright 55 (Cm); O. E. Jennings s.n. [Aug. 22, 1907] (Cm), s.n. [Aug. 27, 1921] (Cm), s.n. [8-21-43] (Cm); Shafer s.n. [July 22, 1900] (Cm), s.n. [Aug. 5, 1900] (Cm). Armstrong Co.: J. M. Fogg 15349 (Up); O. E. Jennings s.n. [Sept. 27, 1904] (Cm). Beaver Co.: Andriessen s.n. [July 1881] (Cm); O. E. Jennings s.n. [Sept. 10, 1906] (Cm), s.n. [Oct. 9, 1921] (Cm). Bedford Co.: Berkheimer 996 (Up), 7583 (Mi); O. E. Jennings s.n. [Oct. 9, 1904] (Cm), s.n. [8/10/1941] (Cm); Q. King s.n. [Aug. 11, 1937] (Cm); Mrs. A. B. Lord s.n. [July—Aug. 1919] (Cm). Berks Co.: Collector undesignated s.n. [prope Reading, 1832] (M); H. N. Moldenke 19372 (N, Or). Blair Co.: Mellor s.n. [July 12th '89] (Cm); Shafer s.n. [July 13, 1889] (Cm). Bradford Co.: O. E. Jennings s.n. [Aug. 21, 1929] (Cm); H. N. Moldenke 17080 (Br, Ml, Nd, Se, St); W. Rhoades s.n. [near Grover, July 1933; H. N. Moldenke 17080] (Bt, Bt—29941, N); H. A. Wahl 17597 (Hi—168734); Westerfeld 817 (Cm). Bucks Co.: Dreisbach 3684 (Mi); MacElwee s.n. [July 22, 1893] (N); McDowell 453 (Up); O'Neill s.n. [August 16, 1930] (I). Butler Co.: Bright s.n. [Aug. 2, 1924] (Cm); J. M. Fogg 15305 (Up); L. K. Henry s.n. [Aug. 1927] (Cm), s.n. [9/16/40] (Cm); O. E. Jennings s.n. [8/19/22] (Cm); Krouse s.n. [7/26/47] (Hi—133056); N. Russell H. 3961 [NR.2355] (We). Cambria Co.: O. E. Jennings 17 (Cm), s.n. [July 24, 1908] (Cm); W. Stone 8870 (Up). Cameron Co.: J. M. Fogg 11538 (Up), 18096 (Up): Jennings & Jennings s.n. [Aug. 20, 1925] (Cm); H. A. Wahl 831 (Up, Ur). Centre Co.: M. T. Travis 714 (Up), 1787 (Up); Westerfeld 648 (Cm). Chester Co.: T. W. Edmondson 6337 (N); F. W. Pennell 12262 (N); M. T. Travis 591 (Up). Clarion Co.: O. E. Jennings s.n. [July 21, 1904] (Cm), s.n. [Sept. 5, 1921] (Cm). Clearfield Co.: J. M. Fogg 15436 (Up); O. E. Jennings s.n. [July 12, 1908] (Cm). Clinton Co.: Wahl & Westerfeld 12097 (Ur). Crawford Co.: O. E. Jennings s.n. [Aug. 19, 1904] (Cm), s.n. [Aug. 4, 1909] (Cm); James A. Murray s.n. [Aug. 1, 1928] (Cm); Shafer s.n. [July 23, 1901] (Cm). Cumberland Co.: A. R. Moldenke 44 [H. N. Moldenke 21767] (Bm), 99 (Fg). Dauphin Co.: H. N. Moldenke 19369 (N). Delaware Co.: Eckfeldt s. s. [July 18, 1938] (Up); F. W. Pennell 14689 (N), 14754 (Cn, Fl—31477, H—56567, Io—153886, It, Um—235, Ur, We); W. Stone 552 (Up), 3122 (Up); W. M. Thompson Jr. 328 (Up). Elk Co.: O. E. Jennings s.n. [July 19, 1904] (Cm). Erie Co.: Jennings & Jennings s.n. [7/26/1925] (Cm, Cm); N. H. Phillips 84 (Up), 205 (Up). Forest Co.: Kosinski s.n. [8/25/1940] (Cm). Franklin Co.: Collector undesignated s.n. [Concord, July 13, 1884] (Mi); H. N. Moldenke 19167 (N). Fulton Co.: A. R. Moldenke 101 (Fg). Huntingdon Co.: E. H. Graham s.n. [7/12/32] (Up); M. T. Travis 790 (Up); H. A. Wahl 1388 (Pl—129973, Ur). Indiana Co.: O. E. Jennings s.n. [July 11, 1908] (Cm); Shafer s.n. [Aug. 8, 1901] (Cm). Jefferson Co.: E. H. McClelland s.n. [8/7.10/22] (Cm). Juniata Co.: J. M. Fogg 15530 (Up). Lackawanna Co.: Charnell 569 (Up); Glowenke 7772 (We); Twining s.n. [July 15, 1907] (Cm). Lancaster Co.: Brubaker 716 (Up), 1315 (Up); F. W. Pennell 13093 (Cm, N); Tanger 3333 (Up), s.n. [July 28, 1937] (Up). Lawrence Co.: L. E. Fox 405 (Fx); Henlen 60 (Cm); O. E. Jennings s.n. [Sept. 18, 1919] (Cm); Whittenberger s.n. [August 30, 1939] (Up). Lebanon Co.: C. H. Kauffman s.n. [Lebanon, August 22, 1928] (Mi); H. N. Moldenke 19370 (N). Lehigh Co.: O'Neill s.n. [Allentown, August 19, 1927] (Fl—21112, I). Luzerne Co.: Glowenke 2875 (Up). Lycoming Co.: J. M. Fogg 11588 (Up), 17719 (N); W. R. Taylor s.n. [Essick Heights, 1912] (Up—75580). McKean Co.: O. E. Jennings s.n. [July 21, 1904] (Cm), s.n. [Sept. 6, 1937] (Cm). Mercer Co.: L. K. Henry 63 (Cm); O. E. Jennings s.n. [Aug. 30, 1923] (Cm); Shafer s.n. [July 17, 1902] (Cm). Monroe Co.: Bernhardt s.n. [Paradise Falls, Aug. 18, 1928] (Mi, Up); Gress, Jennings, & Jennings s.n. [Tobyhanna] (Cm); Henry & Graham s.n. [Aug. 1930] (Cm); Jennings, Jennings, & Gress s.n. [Aug. 1920] (Cm); Langman 1124 (Up). Montgomery Co.: J. M. Fogg 9141 (Up); MacElwee s.n. [June 26, 1892] (N); Wismer 547 (Up). Northampton Co.: Tyler 216 (Br), s.n. [Easton, July 14, 1896] (N). Northumberland Co.: J. M. Fogg 18013 (Up). Perry Co.: A. A. Heller 14222 (Du—157211, Se—84873); A. R. Moldenke 17 [H. N. Moldenke 20489] (F); H. H. Travis s.n. [Sept. 5, 1938] (Up). Philadelphia Co.: Brinton s.n. [8.9.1878] (Pl—115520); I. Burke s.n. [Commons, Phil.] (Up—17108); Dreisbach 1702 (Up); MacElwee 1074 (N); G. Watson s.n. [Philadelphia] (Ca—379996). Pike Co.: Bartram s.n. [July 14, 1917] (Pl—70715); DePue 331 (Up). Potter Co.: Eimer 9 (Cm), s.n. [July 29, 1927] (Cm), s.n. [July 1928] (Cm); H. W. Graham 5 (Cm); H. N. Moldenke 19113 (N, Or). Schuylkill Co.: Arndt s.n. [Aug. 17, 1915] (Up); P. R. Wagner 668 (Up), 2258 (Up), 4878 (Up), 5636 (Up), 7265 (Up). Snyder Co.: H. N.

Moldenke 20479 (N); Wade & Wade 1385 (Up). Somerset Co.: O. E. Jennings s.n. [Sept. 15, 1919] (Cm); B. H. Patterson s.n. [July 19, 1872] (Cm); Van Dersal s.n. [7/31/34] (Cm). Sullivan Co.: W. Stone 5877 (Up), 14710 (Up). Tioga Co.: Gress, Jennings, & Jennings s.n. [Sept. 2, 1920] (Cm); H. N. Moldenke 20466 (N). Union Co.: Will s.n. [8/15/36] (Cm). Venango Co.: Wurdack s.n. [9/6—7/42] (Cm). Warren Co.: O. E. Jennings s.n. [8/22/29] (Cm); Jennings & Bright s.n. [Iron Springs, 1928] (Cm); H. N. Moldenke 16605 (We), 17696 (Br). Washington Co.: Jennings & McKee s.n. [Aug. 10, 1919] (Cm, Up). Wayne Co.: Dix 125 (Up); Jennings, Jennings, & Gress s.n. [Aug. 21, 1920] (Cm). Westmoreland Co.: Block s.n. [July 1881] (Cp, I); Demsire s.n. [8/20/35] (Cm); L. K. Henry 551 (Ca—882656, Hi—192860, W—1810935), s.n. [7/29/37] (Cm), s.n. [9/11/40] (Cm); K. R. Holmes s.n. [July 13, 1902] (Cm); O. E. Jennings s.n. [8/30/19] (Cm), s.n. [Aug. 4—5, 1923] (Cm); Shafer s.n. [Aug. 15, 1900] (Cm). Wyoming Co.: Glowenke 862 (Up); A. D. Granger s.n. [Factoryville, 7/15/1894] (N). York Co.: F. E. Lloyd s.n. [Aug. 6, 1889] (Cm); W. Stone 2164 (Up). County undetermined: Eifrick s.n. [Mt. Lake Park, Aug. 25, 1901] (Cm); Schweinitz s.n. [Pennsylvania, 1829] (Br); C. W. Short s.n. [Pennsylvania] (Lu). DELAWARE: Kent Co.: E. L. Larsen 310 (Up), 1240 (Gu—13840, Up). New Castle Co.: E. L. Larsen 662 (Up). Sussex Co.: N. L. Britton 27 (N); R. R. Tatnall 4302 (Up). MARYLAND: Allegany Co.: Shriver s.n. [May 1894] (N). Baltimore Co.: Boldo 13 (Q). Caroline Co.: E. C. Earle 1566 (Up). Cecil Co.: W. L. Abbott 2448 [Herb. Leonard 4383] (W—2160460); H. N. Moldenke 13802 (Z). Garrett Co.: F. C. Lane 1721 (Ur, Ur); J. D. Smith s.n. [July 15, '98] (W—1323093). Hanover Co.: A. R. Moldenke 491 (Fg). Harford Co.: Shull 156 (N); Tanger s.n. [Aug. 4, 1937] (Up). Howard Co.: A. R. Moldenke 489 (Fg). Montgomery Co.: Tidestrom s.n. [Chainbridge, Oct. 1897] (I). Prince Georges Co.: T. Holm s.n. [Junii 1896] (I); Hyacinth 1457 (Gg—31321); A. R. Moldenke 492 (Fg); Petrak s.n. [20.VII.1950] (S), s.n. [27.VIII.1950] (S); True 558 (Up). Talbot Co.: E. C. Earle 1596 (Up), 1603 (H—52414). Washington Co.: A. R. Moldenke 40 [H. N. Moldenke 21761] (Bm). Worcester Co.: Redmond 198 (I). DISTRICT OF COLUMBIA: F. Blanchard s.n. [near Long Bridge, 11 July 1891] (Dt, N); Camby s.n. [D. C., 1881] (Fc—716); T. Holm s.n. [18/7/1911] (I, S); Kearney s.n. [Aug. 8, 1897] (N); E. C. Leonard 466 (Cp); F. H. Sargent 7608 (Go); E. S. Steele s.n. [July 16, 1896] (Ob—50806); Wismer 368 (H—24409, Up). VIRGINIA: Charles City Co.: A. R. Moldenke 490 (Fg). Fairfax Co.: Killip 36681 (N). Fauquier Co.: Allard 3281 (W—1734757). Floyd Co.: A. R. Moldenke 48 [H. N. Moldenke 21772] (Bm). Frederick Co.: P. Schallert Jr. s.n. [Winchester, 8/27/38]

(Ky). Giles Co.: J. M. Fogg 13011 (Up). Grayson Co.: Radford & Radford 2613 (Hi--35271). James City Co.: Artz 1131 (Up). Loudoun Co.: A. R. Moldenke 68 [H. N. Moldenke 21793] (Bm). Montgomery Co.: R. Kral 9594 (Hi--201637); Murrill s.n. [Blacksburg, August 1894] (Io--30879). Patrick Co.: A. R. Moldenke 49 [H. N. Moldenke 21773] (Bm). Roanoke Co.: Fauntleroy 659 (W--694518); H. N. Moldenke 19248 (N); C. E. Wood 6239 (Hi--51277). Smyth Co.: A. R. Moldenke 60 [H. N. Moldenke 21785] (Bm); J. K. Small s.n. [St. Clair's Bottom, July 30, 1892] (C, Ca--25182, Up--17106, W). Washington Co.: A. R. Moldenke 58 [H. N. Moldenke 21783] (Bm). Wythe Co.: A. R. Moldenke 62 [H. N. Moldenke 21787] (Bm). WEST VIRGINIA: Barbour Co.: A. H. Moore 2569 (Po--145245). Berkeley Co.: A. R. Moldenke 47 [H. N. Moldenke 21770] (Bm). Cabell Co.: F. A. Gilbert 1000 (We). Fayette Co.: L. W. Nuttall 345 (We); Smithson s.n. [14 July '36] (We). Hampshire Co.: Frye 1483 (We). Hancock Co.: Sumpstine s.n. [July 1938] (We); R. West 551 (We, We). Hardy Co.: E. L. Core 3758 (N); L. W. Wilson 138 (We), s.n. [July 20, 1943] (We). Kanawha Co.: Mrs. E. R. Yates s.n. [summer, 1940] (We). Mercer Co.: E. L. Core 1884 (H--33483); E. Dickinson s.n. [7/31/50] (We); Mrs. W. W. Dickinson s.n. [August 21, 1950] (We). Mineral Co.: M. Brown s.n. [Hartmansville, September 1952] (We). Monongalia Co.: Spangler 345 (We); Strausbaugh 345 (We). Nicholas Co.: E. A. Harrison s.n. [July 15, 1955] (We); Lyman s.n. [Fenwick, 8-14-79] (Dt). Ohio Co.: E. A. Bartholomew 53 (We, We), s.n. [August 15, 1934] (We); Guttenberg s.n. [July 9, 1878] (Cm). Pocahontas Co.: Clarkson & Clarkson 612 (We); E. L. Core 3540 (Ob--50795); Herb. West Virg. Bot. Exped. s.n. [July 29, 1930] (S). Preston Co.: Davis & Davis 1448 (We); J. L. Sheldon 1882 (We, We); Spangler 271 (We, We). Putnam Co.: E. L. Core 6463 (We). Raleigh Co.: Tosh 535 (Ca--661131, Ky, We). Randolph Co.: C. B. Clarkson 1775 (We). Summers Co.: Boone 250 (We); Tosh 77 (Ky). Tucker Co.: Allard 9070 (W), 9119 (W), 9233 (W--1872154), 11500 (W--1895058), 21683 (W--2134497); C. B. Clarkson 1478 (We); Davis & Davis 765 (We). Webster Co.: C. F. Millspaugh 583 (We). Wood Co.: W. M. Pollock s.n. [Aug. 7, 1897] (W--315367). NORTH CAROLINA: Ashe Co.: A. E. Radford 38460 (Hi--104888), 38677 (Hi--104889). Orange Co.: Radford & Stewart 200a (Hi--12597). Transylvania Co.: Blomquist 4712 (H--5454). Warren Co.: C. R. Bell 4367 (Hi--92861). Washington Co.: E. J. Alexander s.n. [7/28/23] (Hi--59483). Watauga Co.: Ahles & Duke 47708 (Hi--104890); Ashe s.n. [July 19] (Hi--59485]. County undetermined: Ashe s.n. [mountains of N. C.] (W--327850). SOUTH CAROLINA: Charleston Co.: Gibbes s.n. [Summer, 1859] (N). GEORGIA: Chatham Co.: Nyst s.n. (Br). FLORIDA: Duval Co.: Curtiss s.n. [Jacksonville, 1881] (Oa). OHIO: Ashland Co.: H. N. Moldenke

12171 (Co—445, Da). Ashtabula Co.: I. E. Diehl s.n. [Rock Creek, July 3, 1901] (Ca—373442). Butler Co.: Bridge s.n. [7/30/11] (Cn); J. Ferguson s.n. [July 19, 1932] (Ob—80596). Champaign Co.: Demaree 11689 (Ca—591988, W—1632194); E. C. Leonard 1609 [Herb. Leonard 4350] (W—2162185). Clark Co.: F. P. Davidson s.n. [Springfield, July 1885] (Or—8861). Columbiana Co.: Nicely s.n. [New Garden, July 20, 1958] (We); E. Wilkinson s.n. [31 July 1887] (Ob—80594). Coshocton Co.: H. N. Moldenke 13149 (Co—1290), 13380 (Br, Co—1534, Da, Ec, Ml, Nd, Se, St). Crawford Co.: Benson & Yaussy 309 (Po—267071). Erie Co.: C. L. Booth s.n. [August 2, 1901] (Ob—75335); Friedel s.n. [near Huron, August 25, 1942] (We); Monosmith s.n. [July 13, 1900] (Ob—75337); York s.n. [Cedar Point, 8-1-1902] (Up), s.n. [Cedar Point, 8-3-1902] (Dp). Fairfield Co.: Horr s.n. [Pickerington, Sept. 7, 1833] (Io—15347). Franklin Co.: Condit s.n. [Westerville, July 25, 1909] (Ca—456152); E. B. Williamson s.n. [July 1897] (In). Hamilton Co.: E. L. Braun s.n. [July 10, '17] (Cn), s.n. [8/10/17] (Cn), s.n. [8/10] (Cn); R. Buchanan s.n. (Ll); M. Mohr 465 (Ll); C. W. Short s.n. [prope North Bend] (Bm). Hocking Co.: Demaree 11655 (Ca—591987). Holmes Co.: H. N. Moldenke 12024 (Co—376, Da), 12158 (Co—435, Da). Knox Co.: H. N. Moldenke 12118 (Co—414), 12172 (Co—446, Da). Lake Co.: H. C. Beardslee s.n. [Aug. 2, 1870] (Ob—80598). Licking Co.: H. L. Jones s.n. [Aug. 10, 1889] (Ob—80595). Lorain Co.: H. C. Cowles s.n. [Oberlin, July 21, 1893] (Mi, Ob—75333); M. E. Day s.n. [Aug. 29, '91] (Ob—99796); W. M. Dick s.n. [August 6, 1894] (Du—296882, Ob—75330); Grover s.n. [July 23, 1900] (Ob—75338); F. D. Kelsey s.n. (Ob—50802); Monosmith s.n. [Swift's Hollow, July 13, 1900] (Mn—18491, Um—215); E. W. Phillips s.n. [10/8/1892] (Cm); A. E. Ricksecker 286 (Ob—75339, Ob—75340), s.n. [Oberlin, July 19, 1894] (Se—28246, St—23390), s.n. [Oberlin, Aug. 6, 1894] (Ob—75332, W—217595), s.n. [Oct. 2, 1899] (Ob—75331); A. A. Wright 1 (Ob—75329), s.n. [July 30, 1889] (Ob—75334, Ob—75336). Lucas Co.: Sanford 1956 (S). Medina Co.: Fullerton s.n. [Aug. 7, 1939] (En). Miami Co.: Clevenger s.n. [Fletcher, Aug. 13, 1897] (W—1524139). Ottawa Co.: E. S. Ford 223 (It); J. C. Myers s.n. [July 29, 1940] (We), s.n. [July 31, 1940] (We). Richland Co.: J. C. Myers s.n. [August 7, 1940] (We); E. Wilkinson 8461 (Cm, La, Ob—80597). Wayne Co.: L. S. Hopkins 56 (Br); E. Wilkinson s.n. [W. Salem, July 31, 1887] (H—24538, Ok). Johnson Island: York s.n. [Johnson Island, 7-26-1902] (Up). County undetermined: Black 36-5881 (Be—46571), 36-7097 [Fonte] (Be—47802); Umbach 7111 [Magician Lake] (Ca—46112); York s.n. [Miller's Cove, July 18, 1904] (Up). ILLINOIS: Adams Co.: Brinker 3063 (Il—15879); Evers 799 (N, Ur), 802, in part (Ur); Evers, Jones, & Jones 572 (Ur); A. B. Seymour s.n. [Northeast Turnpike, 20 June 1876] (H—106462); Wehmeyer 19 (Mi, Mi). Boone Co.: Fell & Fell F.46494 (Il—21282). Brown Co.: Winterringer 5253 (Il—35417). Cass Co.: Geyer s.n. [Beardstown, July 1842] (S, Vt); Winterringer 5154 (Il—35538). Champaign Co.: Dembski 67 (Ur); H. A. Gleason s.n. [Jl. 6, 1899] (Ur); Herb. Ill. Ind. Univ. 17459 (Ur); Jewett 435 (Mi); G. N. Jones 12708 (Ur), 12711 (Ur), 12715 (Ur), 12805 (Ur), 16557 (Ur), 16568 (Ur); Knibloe s.n. [Herb. Ill. Ind. Univ. 17460] (Ur); Perino s.n. [August 3, 1950] (Ur); Snyder s.n. [Urbana, July 1881] (Sd—4254); Taft s.n. [Champaign, 1876—79] (Ka); Waites s.n. (Ur—29661); Winterringer 472 (Ur). Clay Co.: Winterringer 2152 (Il—27043). Clinton Co.: Spillman 298 (Pl—22631). Coles Co.: Umbach 1145 (Ca—441525). Cook Co.: H. H. Babcock 9281 (Ba—23753), s.n. [Chicago, Jul. 18, 1874] (Sg—16090); Bakker s.n. [Riverdale, July 1912] (Sd—12753); R. Bebb 1686 (Ok), 2109 (Ok); H. R. Bennett s.n. [Barrington, August 24, 1957] (Go); Blatchford 2515, in part (Il—15820); S. A. Cain s.n. [southern Chicago, 1926] (Bt—2472, Bt—2475), s.n. [August 1926] (Bt—2465); Dixon & Gage 767 (W—609447); H. S. Fawcett s.n. [Berwyn, 9/1/03] (Io—28408); G. D. Fuller 2292 (Il—15880), 8090 (Il—15884); F. C. Gates 1871.2 (Ur), 1873 (Ur); Lansing 1399 (Ur); Munroe s.n. [Chicago] (Po—70996); Sherff 1850 (Ur); H. H. Smith 5993 (Up); E. S. Steele 106 (W—608865); L. F. Ward s.n. [Chicago, August 16, 1897] (W—298088); Waugh 411 (Ka); Wessén s.n. [Chicago, VII.1899] (Go). Crawford Co.: Ahles 4850 (Ur); Winterringer 3753 (Pl—29199). Cumberland Co.: Spooner s.n. [Hazel Dell] (Il—15872); Winterringer 3403 (Il—28729), 5879 (Il—33149). De Kalb Co.: P. B. Whitford s.n. [July 19, 1946] (Ur). Douglas Co.: G. N. Jones 17523 (Ur). DuPage Co.: G. D. Fuller 1706 (Il—15883); W. S. Moffatt 573 (Ur); Umbach s.n. [Naperville, July 23, 1897] (W—339479). Edwards Co.: Winterringer 4177 (Il—30075). Effingham Co.: Ahles 2606 (Ur, Ur); Winterringer 5877 (Il—22151). Fayette Co.: McDougall 91 (Ur); O'Dell 335 (Ur), 336 (Ur). Franklin Co.: Ahles 5525 (Ur); Winterringer 3522 (Il—28915). Henry Co.: Winterringer 5241 (Il—35458). Iroquois Co.: Winterringer 6537 (Il—34123). Jackson Co.: Fuller & Welch 268 (Il—15877), 903 (Il—15873), 1021 (Il—15875); J. W. Voigt 985 (Il—36535); G. Wilson 1021 (Ur). Jefferson Co.: Ahles 5496 (Ur); Winterringer 7784 (Il—37432). Jersey Co.: P. Jacobs 37 (Ur). Jo Daviess Co.: Ahles 4346 (Ur); Pepoon & Moffatt 255 (Ur); Winterringer 8156 (Il—37458). Kane Co.: V. H. Chase 9245 (Ur); E. W. Erlanson s.n. (Mi); Erlanson & Erlanson 1538 (Mi). Kankakee Co.: Fuller & Hungerford 130 (Il—35095); E. J. Hill 222.1878 (Ur); G. N. Jones 15936 (Ur), 16046 (Il—15855, Ur). Lake Co.: R. K. Brown 90 (Ur), 580 (Ur), s.n. [Sept. 5, 1949] (Ur); F. C. Gates 3211 (Mi, Ur), 13494 (Ka--73469); Gleason & Shobe 161 (Ur); L. P. Richardson s.n. [August 15, 1955] (St). LaSalle Co.: G. D. Fuller 1797 (Il--15882); P. B. Whitford 311 (Il--32222). Lawrence Co.: Sivert s.n. [Sept. 14, 1952] (Ur); Winterringer 6191 (Il--33522). Lee Co.: V. H. Chase 5304 (Ur); Keithley 249 (Il--20017), 272 (Il--31488), s.n. [July 12, 1945] (Ur), s.n. [July 28, 1946] (Ur); Lyman s.n. [Amboy, 7-21-94] (Dt). Livingston Co.: G. D. Fuller 9149 (Il--15856, Ur). Logan Co.: Ahles 3050 (Ur). Macon Co.: R. G. Mills s.n. [Decatur, Aug. 10, 1939] (N). Marion Co.: Winterringer 5963 (Il--33306). Mason Co.: F. C. Gates 3887 (Ur). McHenry Co.: Nason s.n. [Algonquin, Aug. 6, 1878] (Ur), s.n. [Algonquin, Aug. 28, 1879] (Ur). McLean Co.: Winterringer 5071 (Il--35890). Montgomery Co.: Winterringer 3880 (Il--29176). Moultrie Co.: Winterringer 9107 (Il--39392). Ogle Co.: Blount 120 (Il--30843); A. L. Hills 3434-0 (Il-15876), 3452-0 (Ur), 3640-0 (Il--15858). Peoria Co.: Heading s.n. [1875] (Ur); F. E. McDonald s.n. [Peoria, July 1886] (Ur), s.n. [Peoria, July] (Ur). Perry Co.: I. L. Forbes s.n. [Duquoin, VIII-16-'27] (Io--129208); Steiner s.n. [July 1, 1948] (Ur); Winterringer 3945 (Il--29075). Piatt Co.: G. N. Jones 21634 (Ur); Winterringer 626 (Ur). Pope Co.: Rapp & Rapp 56 (N, Ur), 57 (N, Vi), 58 (Ur). Pulaski Co.: Winterringer 5992 (Il--33180). Richland Co.: Ridgway 1173 (Ur, Ur), 1174 (Ur); Scherer 406 (Il--26359, Ur). Saint Clair Co.: J. Neill 1299 (Il--24721). Saline Co.: Winterringer 3511 (Il--28927). Sangamon Co.: G. D. Fuller 5039 (Il--15863), 5330 (Il--15864), 5572 (Il--15867), 5593 (Il--15870), 5849 (Il--15861), 6099 (Il--15862), 6156 (Il--15868); H. N. Moldenke 21882 (S). Stark Co.: V. H. Chase 981 (Ur), s.n. [July 10, 1896] (Ur, Ur). Stephenson Co.: Ahles 4500 (Ur); Serf 9844 (Il--15857); Winterringer 8100 (Il--37535). Tazewell Co.: V. H. Chase 3229 (Al, Il--15878, N, Ur, Ur). Union Co.: G. D. Fuller 674 (Ur).

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BOOK REVIEWS

Alma L. Moldenke

"The Growth of Plants", by G. E. Fogg, 288 pp. Penguin Books Inc., Baltimore 11, Maryland. 1963 $1.65 paper back.

What an excellent elementary, modern, thorough, introductory text to the field of plant physiology this book is! The organization is unlike most standard texts in this field and is planned to emphasize the interrelations among processes, functions and structures from the atom to the organism in its complex environment level. The main parts are (1) increase in substance from raw materials and light with subsequent respiration and photosynthesis, (2)growth of parts and their differentiation into cells and tissues, (3) organization of the whole plant with the intermingling factors controlling transport of materials and with correlations between plant organs, (4) plants and their environment with concomitant problems of periodicity and growth under varying conditions, and (5) conclusion with the outlook for the future of plant physiology and with sources for further reading. This bibliography very wisely lists a handful of general books on this subject in an ascending order of difficulty and then lists about a score of special topic books for this field. Throughout the text many historically and scientifically significant experiments are cited usually with the name(s) of the researcher(s) and date of publication. I personally missed footnotes with title of paper and journal of publication, but the author lists at the end of the bibliography the main sources for locating such papers, e.g., Biological Abstracts, etc.

The book is effectively illustrated with plant photographs and diagrams with apt legends. The print is easily readable. In the introduction the survey work on cytology and histology could also be found in a 50-year old book. A tissue is defined as "cells joined together", and algae as "a group which includes the seaweeds and their microscopic relations". These are poor "slips" from a scientist of high caliber work and of ordinarily careful language use. It was wise to mention the scientific names of plants along with their common ones; the latter often vary from place to place or represent a whole genus instead of a single species. Why the author used the spelling Lyriodendron on page 251 is not clear. These points of criticism are for minutiae; the important content is laid before the readers in excellent manner.

This book should be useful to the science-minded lay reader, the intellectually gifted secondary school biology student, and non-science major college students taking a survey course in biology. Because of the present welcomed trend to add more liberal arts training to our numerous and huge state teachers colleges, this book, along with several other easy reading, up-to-date, scientifically accurate "paper backs", could give a good foundation in biology. Tomorrow's students will have even greater need for better trained classroom leadership.

"The Developmental Anatomy of Isoetes", by Dominick J. Paolillo, Jr., 130 pp., University of Illinois Press, Urbana, Illinois. 1963. $2.50 paper bound, $3.50 cloth bound.

This New World, present day study is done with the precision of related past work done by the Old World Hofmeister, von Mohl and others. This newer work wisely omits hundreds of man-hours executed on finely stippled drawings, but it is even more effectively illustrated by photography through an ortholux fluorescent microscope, by modern differential slide staining, by clearcut cell outline drawings, and by clear orthostichy graphs in the mathematical patterns of our day. Comparison studies of Isoetes howellii of different ages were made to reveal the nature and significance of sporophyte development especially.

The literature in this field that covers a span of a century and a half is well surveyed, evaluated and organized concisely. The author's main new contributions are (1) a substitution of a group of apical initials in the shoot from the time of first recognition for Hofmeister's single enduring apical cell concept, (2) the ground meristem and the procambium developing from histologically undifferentiated tissues underlying the shoot apex, (3) regarding lateral and basal meristem as derived from a single cambium, (4) arrangement of roots in series and in orthostichies produced by the formation of root primordia on sites of the root initiator and by alternate displacement of the primordia to one side or the other of the basal meristem, and (5) provision for a terminology that may avoid semantic difficulties. The publisher of this No. 31 in the Illinois Biological Monographs has used fine paper and clear type. By a "fancy" arrangement of the index on two halves of the same piece of paper, the publisher is going to rob many busy scientists and students of a few extra seconds each of their precious time flapping over a page unnecessarily.

"Manual of Vascular Plants of Northeastern United States and Adjacent Canada", by Henry Allen Gleason and Arthur Cronquist, 810 pp., Van Nostrand Co., Princeton, N. J., 1963. $11.75

This is a portable-to-field, -to-classroom, or -to-lab condensation of the 1952 three volume reference work of the senior author's "New Britton and Brown Illustrated Flora". Any variations in content from this source are the work of the junior author.

The book encompasses much of the same area covered by Fernald's "Gray's Manual of Botany", edition 8 (1950), but with more compact and strictly dichotomous keys, with the introduction of type, eye and paper saving abbreviations, and with the regrettable omission of numerous subspecific taxa, such as color forms in Allium, Apios, Daucus, Lilium, Rudbeckia, etc. Omitted also are a couple of labeled flower structure diagrams which could easily have been placed on the unused part of the page at the end of the glossary, and the accent marks on the scientific names so helpful to the amateur as well as the college student. The following terms that appear abundantly in the generic and specific descriptions could easily have been reduced to abbreviations — tepal, pistil, stigma, style, ovary, stamen, anther, filament. The listings in the glossary are well selected and interpreted. The term "frond" is limited to ferns only. "Re" could have been used as a space saving substitute for the frequently used "descriptive of". It is also most regrettable that recommended common names are omitted for many species both in this book and its parent -- these and complete lists of synonymy were among the most valuable features of the earlier editions of Britton & Brown. Such recommended common names could have a stabilizing effect on identifications -- as they do in ornithology, for instance -- regardless of how taxonomists may shift a given taxon from one genus or rank to another.

The flexible cover is handy for field work. It is hoped that the back binding will hold up over the years of handling like those of the last few editions of the Gary's "Manual" did. The small but clear print is a necessary concomitant to keeping the book portable.

For a technical work that will become a "bible" for many the text has a surprising number of printing errors not checked on galley proof. The misspellings of monocotyledons and *Clerodendrum* on pages xxvii and 582 are examples. For misprintings affecting scientific terms there should be a corrected list supplied with all copies of the book sold in the future.

Specific names are not all lower-cased (as is done uniformly by zoologists and paleontologists) and all family names (like *Labiatae* and *Gramineae*) are not given the uniform -*aceae* ending. The now-in-vogue repetition of a specific epithet as a varietal name produces ludicrous tautonyms and Gertrude Steinian polynomials, as, for instance, *Solidago rugosa rugosa rugosa* on p. 715. Would not the designation of a logotype for *Quercus rubra* L. avoid the rejection of this well known name as a "nomen ambiguum"?

In keeping with recent researches some changes have been made in classification and some previously published errors have been corrected. However, many named hybrids, as, for instance, in *Quercus* and *Viola*, are not mentioned, nor are such long known escapes from cultivation as *Acer palmatum*, *Parthenocissus tricuspidata*, and *Platanus acerifolia*. A few species, new for this range and substantiated by herbarium vouchers in the New York Botanical Garden herbarium, such as *Inula graveolens*, have been omitted. Do not most modern pteridophytists divide the old *Polypodiaceae* into smaller families? The evidence presented by Canadian botanists that our common northern pipewort is genetically and phenotypically distinct from the European *Eriocaulon septangulare* has been ignored.

Such a tremendous amount of careful and valuable scientific work has gone into the production of this book and its parent volumes, which will be used by so many persons for so many years to come, that it seems sad to note that the authors still follow the outmoded Englerian system of classification, rather than the far more realistic Hutchinsonian. In any event, the authors' efforts will be appreciated by many users of these books in the years to come.

NOTES ON BROMELIACEAE, XX

Lyman B. Smith

COSTA RICA

VRIESEA RANIFERA L. B. Smith, sp. nov.

A V. thyrsoidea Mez, cui habitu valde simulans, bracteis florigeris subduplo majoribus angustioribus sepala subaequantibus, floribus longe pedicellatis differt.

Flowering over 8 dm. high; leaves 4 dm. long; sheaths broadly elliptic but scarcely wider than the blades, ca. 15 cm. long, covered with a very close lacquer-like coat of gray scales; blades ligulate, rounded and apiculate, 10 cm. wide, flat, densely but inconspicuously appressed-lepidote, reddish brown beneath, green above; scape straight, stout, glabrous; scape-bracts densely imbricate and completely covering the scape, broadly elliptic, apiculate, purple, the extreme apex spreading; inflorescence densely bipinnate, slenderly fusiform, 32 cm. long, 8 cm. in diameter, glabrous; primary bracts broadly ovate, apiculate, slightly but consistently shorter than the branches, subcoriaceous when dry, probably subfleshy in life; branches suberect, laxly few-flowered with the terminal flower usually much reduced, 4 cm. long, floriferous to base; rhachis slender, flexuous; floral bracts distichous, oblong-elliptic, to 27 mm. long, nearly or quite equaling the sepals, evidently fleshy, obtusely carinate toward apex; pedicels rather slender, to 8 mm. long; flowers not secund; sepals narrowly elliptic, obtuse, 24 mm. long, 10 mm. wide, coriaceous, ecarinate; petals white, bearing 2 acute scales at base; stamens included. Pl. I, fig. 1: Primary bract and branch x 1/2; fig. 2: Sepal x 1.

COSTA RICA: Rare in cloud forests of El Alto de la Palma, alt. 1500-1550 m., C. K. Horich (US, type). Cultivated and flowered in the University of California Botanic Garden, September 27, 1961, accession number 58.482-1. The collector reports that endemic species of frogs live and apparently breed in these plants.

AMAZONIAN SOUTH AMERICA

NEOREGELIA

Recent explorations in the upper Amazon Basin have brought to light a number of new species of Neoregelia that fortify Ule's original concept of a subgeneric group. They all agree in having a slender ovary that merges with the very indistinct thickish pedicel, while the species of the eastern Brazilian rainforest have an ovary that is rounded at base and sharply contrasting with the distinctive slender pedicels. The Amazonian species may be summarized as follows:

1. Leaf-blades ligulate; pedicels 15 mm. long; inflorescence compound, many-flowered; sepals free, 21-26 mm. long. 1. *N. eleutheropetala*
1. Leaf-blades narrowly triangular, long-attenuate; pedicels short.
 2. Sepals free; inflorescence compound.
  3. Sepals glabrous; leaves uniform..........2. *N. myrmecophila*
  3. Sepals lepidote; inner leaves basally pink...3. *N. wurdackii*
 2. Sepals connate for 2-7 mm.; inflorescence compound or simple.
  4. Leaf-blades 5 mm. wide; sepals connate for 5-6 mm. 4. *N. pendula*
  4. Leaf-blades 10-30 mm. wide.
   5. Sepals 18-32 mm. long; inflorescence compound; leaf-blades 25-40 mm. wide.
    6. Sepals 32 mm. long, lepidote; leaf-blades much longer than the sheaths................................5. *N. rosea*
    6. Sepals 18 mm. long, subglabrous; leaf-blades mostly shorter than the sheaths.....................6. *N. peruviana*
   5. Sepals 10-13 mm. long; inflorescence simple.
    7. Stolons 8 mm. thick; leaves numerous in each rosette, the sheaths ca. 15 cm. long; blades antrorse-spinose; inflorescence few-flowered.....................7. *N. mooreana*
    7. Stolons 4 mm. thick; leaves about 5 in each rosette, the sheaths 3-5 cm. long; blades retrorse-spinose; inflorescence 2-flowered.......................8. *N. stolonifera*

1. NEOREGELIA ELEUTHEROPETALA (Ule) L. B. Smith, Contr. Gray Herb. 104:78. 1934.

1a. NEOREGELIA ELEUTHEROPETALA var. ELEUTHEROPETALA

Nidularium eleutheropetalum Ule, Verh. Bot. Ver. Brand. 48: 131. 1907.

Aregelia eleutheropetala Mez ex L. B. Smith, Contr. Gray Herb. 98:5, pl. 1, figs. 4-6. 1932.

Leaf-blades essentially concolorous.

VENEZUELA, COLOMBIA, PERU, BRAZIL.

1b. NEOREGELIA ELEUTHEROPETALA var. BICOLOR L. B. Smith, Phytologia 8:227. 1962.

Leaf-blades strongly bicolorous because of the dense minute whitish scales on the under surface.

PERU.

2. NEOREGELIA MYRMECOPHILA (Ule) L. B. Smith, Smithsonian Misc. Coll. 126:30. 1955.

Nidularium myrmecophilum Ule ex Karst. & Schenk, Vegetationsbild 3: under pl. 3, 4. 1906; Verh. Bot. Ver. Brand. 48: 132. 1907.

Aregelia myrmecophila Mez, Engler Pflanzenreich IV, 32:52. 1934.

BRAZIL.

Additional material may indicate stronger division between

Ule's two forms, latifolia and angustifolia.

3. NEOREGELIA WURDACKII L. B. Smith, sp. nov.

A N. myrmecophila (Ule) L. B. Smith, cui affinis, sepalis lepidotis, foliis interioribus basi roseis differt.

Plant epiphytic, stoloniferous; stolons flattened, 11 mm. wide; leaves about 15 in a funnelform rosette, to 8 dm. long, subdensely appressed-lepidote with brown-centered scales, the inner ones pink toward base; sheaths suborbicular, ca. 8 cm. long, entire except near apex; blades linear, attenuate, 15 mm. wide, flat, laxly serrate with black antrorse spines 1.5 mm. long; inflorescence sunk in the center of the rosette, compound, corymbose, many-flowered, 3 cm. in diameter; primary bracts elliptic, apiculate, exceeded by the sepals; floral bracts oblong, broadly acute, thin and whitish except for the slightly excurrent green midrib, 25 mm. long, sparsely lepidote; sepals free, strongly asymmetric, 14 mm. long including the 2 mm. long blunt mucro, pale green, sparsely lepidote, the posterior ones carinate with the keels decurrent on the ovary; petals free, naked, white, the blades acuminate; ovary subcylindric, merging with the short indistinct pedicel. Pl. I, fig. 3: Inflorescence x 1/2; fig. 4: Floral bract x 1; fig. 5: Sepal x 1.

PERU: AMAZONAS: Prov. Bagua: Epiphytic 3-6 m. above ground, occasional, forested ridge on right bank of Río Santiago 3-4 km. above mouth, alt. 300-350 m., October 29, 1962, J. J. Wurdack 2469 (US, type; USM).

4. NEOREGELIA PENDULA L. B. Smith, sp. nov.

A N. myrmecophila (Ule) L. B. Smith, cui affinis, sepalis basi connatis, foliorum laminis angustioribus differt.

Plant epiphytic, stoloniferous; stolons elongate, pendent, 2.5 mm. in diameter; leaves about 15 in an erect ellipsoid rosette at the end of the stolon, sparsely lepidote soon becoming glabrous; sheaths broadly ovate, 4-5 cm. long, entire except near apex; blades linear, attenuate, 5 mm. wide, flat, laxly serrate with broad flat spreading spines 2 mm. long, the inner red at base or completely; inflorescence sunk in the center of the rosette, few-flowered, simple, 1 cm. in diameter; floral bracts elliptic, acute, slightly exceeding the ovary, pale, membranaceous, sparsely lepidote; sepals strongly asymmetric, broadly acute, 21 mm. long, connate for 5-6 mm., glabrous; ovary cylindric, merging into the very short pedicel; seeds few, ellipsoid, 5 mm. long, nearly smooth.

4a. NEOREGELIA PENDULA var. PENDULA

Foliorum laminis elongatis; sepalis purpureis.

Leaves to 38 cm. long; sheaths wholly green; sepals dark purple; petals blue (! Wurdack). Pl. I, fig. 6: Habit x 1/2; fig. 7: Sepal x 1.

PERU: AMAZONAS: Prov. Bagua: Low epiphyte, rainforest along Río Santiago 3-5 km. above mouth, alt. 250-300 m., October 8-13, 1962, J. J. Wurdack 2166 (US, type).

4b. NEOREGELIA PENDULA var. BREVIFOLIA L. B. Smith, var. nov.

Foliorum laminis brevibus; sepalis viridibus.

Leaves not over 18 cm. long; sheaths dark purple except near apex; sepals green; petals white (! Wurdack).

PERU: LORETO: Prov. Alto Amazonas: High epiphyte, rainforest on lower north slopes of Cerros Campanquiz at Pongo de Manseriche, right bank of Río Marañón, alt. 300-550 m., October 19-21, 1962, *J. J. Wurdack* 2345 (US, type; USM).

5. NEOREGELIA ROSEA L. B. Smith, sp. nov.

A *N. mooreana* L. B. Smith, cui affinis, foliis utrinque densissime cinereo-lepidotis, inflorescentia composita, sepalis subduplo majoribus differt.

Plant epiphytic; leaves rosulate, many, 5-6 dm. long, covered on both sides with appressed brown-centered cinereous scales; sheaths elliptic, ample, 18 cm. long, dark castaneous, entire except near apex; blades very narrowly triangular, attenuate, 25-40 mm. wide, laxly serrate with antrorse dark spines 5 mm. long; inflorescence sunk in the center of the rosette, compound, many-flowered, 5 cm. in diameter; primary bracts broadly elliptic, mucronate, 5-6 cm. long, exceeded by the sepals, subdensely brown-lepidote, basally rose (! Wurdack); floral bracts elliptic, acute, pungent, about equaling the primary bracts, lepidote; sepals strongly asymmetric, acute, pungent, 32 mm. long, connate for 6-7 mm., lepidote; ovary slenderly cylindric, 32 mm. long, merging with the short obscure pedicel. Pl. I, fig. 8: Inflorescence x 1/2; fig. 9: Sepal x 1.

PERU: LORETO: Prov. Alto Amazonas: High epiphyte, rainforest on middle north slopes of Cerros Campanquiz at Pongo de Manseriche, right bank of Río Marañón, alt. 550-750 m., October 22, 1962, *J. J. Wurdack* 2389 (US type).

6. NEOREGELIA PERUVIANA L. B. Smith, sp. nov.

A *N. mooreana* L. B. Smith, cui affinis, foliorum laminis vaginas subaequantibus vel brevioribus, inflorescentia composita, sepalis majoribus glabrisque differt.

Plant epiphytic, stoloniferous; stolons 8 mm. in diameter; leaves many in a broadly funnelform rosette, ca. 15 cm. long, covered with appressed cinereous scales but soon glabrous; sheaths elliptic, ample, mostly longer than the blades, entire except at apex; blades suberect, triangular, attenuate, pungent, 30 mm. wide, flat, repand-serrate with broad flat spines 4 mm. long; inflorescence sunk in the center of the rosette, depauperately compound, rather few-flowered; primary bracts elliptic, pungent-apiculate, 45 mm. long, slightly exceeding the sepals at anthesis, submembranaceous, sparsely brown-lepidote, obscurely serrulate toward apex; floral bracts oblong, pungent-apiculate, 32 mm. long, about equaling the sepals, thin, lepidote; sepals asymmetric, apiculate, 18 mm. long, connate for 5 mm., glabrous or nearly so; petals white (! Wurdack); ovary cylindric, merging with the obscure 2 mm. long pedicel. Pl. I, fig. 10: Outer bract x 1/2; fig. 11: Inflorescence x 1/2; fig. 12: Floral bract and flower x 1.

PERU: LORETO: Prov. Alto Amazonas: High epiphyte, locally frequent, rainforest on lower northwest slopes of Cerros Campanquis, Río Marañón just above Pongo de Manseriche, alt. 250-350 m., October 17, 1962, J. J. Wurdack 2320 (US, type; USM).

7. NEOREGELIA MOOREANA L. B. Smith, Phytologia 8:227, pl. 2, fig. 6. 1962; Graf, Exotica ed. 3, 1659. 1963.

Neoregelia ossifragi Hort. ex L. B. Smith, Phytologia 8:227. 1962; Graf, Exotica ed. 3, 441. 1963. Nomen.

PERU.

8. NEOREGELIA STOLONIFERA L. B. Smith, sp. nov.

A N. mooreana L. B. Smith, cui affinis, stolonibus gracilibus, foliis paucis parvis, spinis retrorsis, inflorescentia biflora differt.

Plant stoloniferous, undoubtedly epiphytic; stolons 6-14 cm. long, 4 mm. in diameter; leaves about 5 in each rosette, to 18 cm. long, densely cinereous-lepidote throughout but soon glabrous; sheaths elliptic, ample, 3-5 cm. long, entire; blades spreading to recurved, linear, attenuate, 10-14 mm. wide, laxly serrulate with retrorse dark 2 mm. long spines; inflorescence 2-flowered, sunk in the center of the rosette; floral bracts elliptic, apiculate, equaling the sepals, lepidote; sepals distinctly asymmetric, 10 mm. long, connate for 2 mm., lepidote; petal-blades ovate, acute; ovary cylindric, merging into the short obscure pedicel. Pl. I, fig. 13: Habit x 1/2; fig. 14: Sepal x 2

PERU: LORETO: Vicinity of Iquitos (?), 1963, Lee Moore 50 (US, type).

VENEZUELA

PITCAIRNIA BREWERI L. B. Smith, sp. nov.

A P. heliophila L. B. Smith, cui valde affinis, foliis utrinque glabris, sepalis acutis differt.

Plant wholly glabrous at anthesis, flowering 1 m. high; leaves many in a bulbous rosette, homomorphic, over 5 dm. long; sheaths reniform, 4 cm. wide, dark castaneous, lustrous; blades very narrowly subtriangular, slightly narrowed at base, attenuate, 20 mm. wide, flat, very laxly serrate with slender antrorse spines 2 mm. long; scape erect, 6 mm. in diameter; scape-bracts strict, subfoliaceous, serrulate, all but the highest exceeding the internodes; inflorescence very laxly subtripinnate, subpyramidal, over 4 dm. long, 3 dm. wide, red; primary bracts narrowly triangular, shorter than the sterile mostly naked bases of the branches, the lowest serrulate; branches spreading, mostly simple, slender, slightly flexuous; floral bracts downwardly secund with the flowers, elliptic, apiculate, 8 mm. long, exceeding the very short but slender pedicels, membranaceous; flowers spreading; sepals linear, acute, 22 mm. long, ecarinate; petals naked, undeveloped in the type; ovary 2/3 superior; ovules alate. Pl. II, fig. 1: Branch of inflorescence x 1/2; fig. 2: Sepal x 1.

VENEZUELA: BOLÍVAR: Cardona camp, near Chivapure, on the Río Blanco near the headwaters of the Suapure and Parguazo, 5 km. from Cerro Guanay, latitude 6 30' N., longitude 66 30' W., alt. 400 m., August 4, 1962, C. Brewer 31 (VEN, type).

COLOMBIA

RONNBERGIA DELEONII L. B. Smith, sp. nov.

Ab omnibus speciebus Ronnbergiae sepalis longe mucronatis differt.

Stemless, flowering shoot 25 cm. high; leaves about 10 in a funnel-form rosette, over 5 dm. long, much exceeding the inflorescence; sheaths suberect, elliptic, about equaling the inflorescence; blades spreading, oblong, strongly narrowed at base but not petiolate, 6 cm. wide, sparsely serrulate, green except for a whitish median channel; scape erect, short, slender, covered with white subspreading narrow scales; scape-bracts erect, densely imbricate and wholly covering the scape, elliptic, apiculate, pale green, white-lepidote, laxly serrulate; inflorescence simple, subcapitate, 6 cm. long, densely white-lepidote except the petals; lowest floral bracts like the scape-bracts, about equaling the flowers, the others narrowly triangular and greatly reduced; flowers sessile, spreading and curved upward; sepals strongly asymmetric with a broad semicircular wing, 30 mm. long, connate for 8 mm., the narrowly triangular apex 13 mm. long and merging into a long slender mucro; petals white, bearing vertical folds the entire length of the claw, the blade broadly elliptic, rounded and apiculate, 13 mm. long; ovary subglobose, 10 mm. long, epigynous tube crateriform, 2 mm. high, placentae apical. Pl. II, fig. 3: Habit (from photo) x ca. 1/15; fig. 4: Sepal x 1.

COLOMBIA: NARIÑO: Near Espriella, April 1960, cultivated and flowered, 1963, Nat J. DeLeon no. N.D. 359 (US, type).

ECUADOR

TILLANDSIA GILMARTINIAE L. B. Smith, sp. nov.

A T. tetrantha R. & P., cui affinis, bracteis florigeris flores multo superantibus differt.

Flowering 50 cm. high (! Gilmartin); leaves many, rosulate, 45-60 cm. long, covered with appressed cinereous scales; sheaths elliptic-ovate, 20 cm. long, 10 cm. wide, dark castaneous; blades ligulate, attenuate, 4 cm. wide, green; scape erect; scape-bracts much exceeding the internodes, lanceolate, acuminate, 8 cm. or longer, thin, densely lepidote; inflorescence over 20 cm. long, decurved, laxly bipinnate, except for the petals covered with ferruginous stellate subappressed scales; axis flexuous, 7 mm. in diameter; primary bracts like the scape-bracts, exceeding the spikes; spikes spreading, to 55 mm. long including the short naked sterile base, 20 mm. wide, strongly complanate, subdensely 12-flowered; rhachis slender, flexuous, exposed toward base; floral bracts broadly ovate, acute, to 15 mm. long, exceeding the flowers, incurved, ecarinate, membranaceous, prominently nerved;

flowers not secund, subsessile; sepals free, asymmetric, subquadrate, cuspidate, 9 mm. long; petals barely exceeding the sepals; stamens included. Pl. II, fig. 5: Primary bract and spike x 1/2; fig. 6: Sepal x 1.

ECUADOR: COTOPAXI: Scrub (fire climax?), Pilaló, alt. 2200 m., August 19, 1962, Mrs. Amy Jean Gilmartin 799 (US, type).

PERU

GUZMANIA XIPHOLEPIS L. B. Smith, sp. nov.

A *G. nubicola* L. B. Smith, cujus bracteas primarias spicasque valde imitans, bracteis florigeris acutis sepala superantibus differt.

Flowering 1.6-2 m. high; leaves to 8 dm. long; sheaths elliptic, 25 cm. long, 12 cm. wide, densely and minutely appressed-lepidote, castaneous beneath with a narrow pale margin; blades ligulate, broadly subacute and apiculate, 7 cm. wide, flat, green, concolorous, glabrous above, obscurely lepidote beneath; scape erect, 14 mm. in diameter, glabrous; scape-bracts erect, imbricate, the lower subfoliaceous, the upper elliptic, acute; inflorescence bipinnate, cylindric, 4-5 dm. long, sublax except the extreme apex, glabrous, green (! Wurdack), becoming castaneous when dry; axis flexuous; primary bracts orbicular, apiculate, the lowest 5 cm. long and covering the reduced spikes, the highest about half as long as the spikes; spikes sessile, globose (except the lowest), 5 cm. long, many-flowered; floral bracts straight, ovate, acute, 25 mm. or longer, exceeding the sepals, ecarinate, even or slightly rugose in drying; flowers subsessile; sepals lanceolate, acute, 22 mm. long, equally connate for 4 mm., carinate, coriaceous, castaneous when dry; petals yellow, naked, the claws conglutinate into a tube, the blades spreading, lanceolate, acute, 15 mm. long; stamens exserted from the throat of the corolla but much shorter than the petals. Pl. II, fig. 7: Primary bract and spike x 1/2; fig. 8: Sepal x 1.

PERU: AMAZONAS: Prov. Bongará: Epiphytic 5-10 m. above ground, locally frequent in moist forest, hills west-northwest (310-320) of Pomacocha, alt. 2300-2700 m., June 19, 1962, *J. J. Wurdack* 917 (US, type; USM).

PITCAIRNIA CLAVATA L. B. Smith, sp. nov.

A *P. nigra* André, cujus inflorescentiam imitans, foliorum petiolis integris, laminis lineari-lanceolatis utrinque longe attenuatis serrulatis differt.

Short-caulescent, flowering 95 cm. high; leaves all alike, 18 dm. long; sheath narrowly triangular, about 15 cm. long, entire, merging with the petiole, covered beneath with dark ferruginous appressed scales; petiole 5-10 mm. wide, channeled, entire; blade linear-lanceolate, long-attenuate at both ends, flat, 6 cm. wide, laxly and finely serrulate, green and glabrous above, covered beneath with a thin membrane of scales; scape erect, ca. 8 mm. in diameter at the middle, glabrous; scape-bracts erect, densely imbricate, the lower subfoliaceous, the upper broadly ovate, acuminate; inflorescence simple, clavate-spicate, broadly ellipsoid, 12 cm. long, glabrous; floral bracts broadly ovate, triangular-acute, 5 cm. long, red, curved-spreading toward apex; flowers subsessile; sepals oblong, broadly acute and apiculate, 30 mm. long, 5 mm. wide, ecarinate; petals 7 cm. long, red drying to purple, bearing a large oblong scale at base, slightly zygomorphic at apex and forming a hood over the nearly equal stamens; ovary 1/2 inferior; ovules obtuse. Pl. II, fig. 9: Inflorescence x 1/2; fig. 10: Sepal x 1.

PERU: LORETO: Prov. Alto Amazonas: Terrestrial, rainforest at upper end of Pongo de Manseriche, Río Marañón, alt. 250 m., October 26, 1962, J. J. Wurdack 2419 (US, type).

PITCAIRNIA MELANOPODA L. B. Smith, sp. nov.

P. schiedeana Baker in systema Mezii proxima sed pedicello brevissimo, sepalis minimis rotundatis apiculatisque differt.

Flowering 27-30 cm. high, stemless; leaves all alike, to 17 cm. long, entire; sheaths ovate, small, nearly black, densely imbricate and forming a narrowly ovoid or subcylindric pseudobulb 4-6 cm. long; blades sessile, deciduous, linear, attenuate, 2 mm. wide, white-floccose at base, soon glabrous; scape erect, 1.5 mm. in diameter, white-flocculose especially at the nodes; scape-bracts much shorter than the internodes, ovate, acuminate; inflorescence simple, sublax, 7 cm. long, white-flocculose; floral bracts like the upper scape-bracts, to 13 mm. long, the lower ones exceeding the sepals; flowers divergent; pedicels slender, 2 mm. long; sepals oblong, rounded and apiculate, 7 mm. long, ecarinate; petals 12 mm. long, yellow, naked; ovary 4/5 superior; ovules not seen. Pl. II, fig. 11: Leaf-blade x 1/2; fig. 12: Scape and inflorescence x 1/2; fig. 13: Sepal x 1.

PERU: AMAZONAS: Prov. Bongará: Terrestrial, rare, Jalca zone along Yambrasbamba-Pomacocha trail between Yanayacu and Pomacocha, alt. 2300-2400 m., June 26, 1962, J. J. Wurdack 1070 (US, type; USM).

PUYA FULGENS L. B. Smith, sp. nov.

A P. pyramidata (R. & P.) Schult. f., cui affinis, foliorum laminis longioribus angustioribus supra dense lepidotis, floribus haud reflexis differt.

Flowering 6-11 dm. high; leaves many in a dense rosette, to 5 dm. long; sheaths suborbicular, 25-30 mm. long, pale toward base, dark castaneous toward apex, entire, glabrous; blades very narrowly triangular, attenuate, pungent, 10-15 mm. wide at base, glabrous beneath, covered above with whitish subappressed scales, laxly serrate with subspreading straight slender brown 10 mm. long spines; scape erect, to 15 mm. in diameter, white-flocculose becoming glabrous; scape-bracts erect, exceeding the internodes the lower subfoliaceous, densely imbricate, the upper broadly ovate and dark lustrous brown with a narrowly triangular green blade, pectinate-serrate, exposing much of the scape; inflorescence cylindric, 3-5 dm. long, simple or pseudo-simple with short inconspicuous branches at base, lax except at apex, white-flocculose soon becoming glabrous; primary bracts like the upper scape-bracts, covering the few-flowered axillary branches; floral bracts of the main axis like the primary bracts but merely acuminate and wholly brown, about equaling the sepals, floral bracts of the lateral branches broadly acute, entire, distinctly exceeded by the sepals; pedicels slender, 10 mm. long; flowers spreading; sepals elliptic, obtuse, 15 mm. long, white-lanate at apex; petals naked, 25 mm. long, pale green. Pl. II, fig. 14: Leaf-base x 1/2; fig. 15: Floral bract and flower x 1/2; fig. 16: Sepal x 1.

PERU: AMAZONAS: Prov. Chachapoyas: Terrestrial, abundant, summit of Cerro Malcabal (Cerro Tumbe) 3-6 km. southwest of Molinopampa, alt. 2850-2900 m., July 20, 1962, *J. J. Wurdack* 1458 (US, type; USM).

PUYA MARIAE L. B. Smith, sp. nov.

A *P. isabellina* Mez, cui affinis, foliorum laminis haud repandis subtus omnino lepidotis, pedicellis elongatis, floribus majoribus differt.

Flowering 7-20 dm. high (! Wurdack); leaves 1 m. long; blades narrowly triangular, attenuate, 5 cm. wide, covered beneath with fine appressed cinereous scales, laxly serrate with flat pale antrorse 5 mm. long spines; scape erect, 25 mm. in diameter near middle, densely and finely white-lanate; scape-bracts erect, densely imbricate and completely covering the scape, the lower subfoliaceous, the upper lance-ovate, acute, finely white-lanate, denticulate; inflorescence simple, densely cylindric, 4 dm. long, 15 cm. in diameter including the petals, many-flowered, except the petals densely and finely white-lanate; floral bracts like the upper scape-bracts but only obscurely denticulate and recurving toward apex, to 9 cm. long, much exceeding the sepals if extended; pedicels slenderly cylindric, ca. 2 cm. long; sepals lance-oblong, obtuse, 37 mm. long; petals naked, 7 cm. long, cream (! Wurdack). Pl. II, fig. 17: Old flower x 1/2; fig. 18: Sepal x 1.

PERU: AMAZONAS: Prov. Chachapoyas: Abundant on cliff faces, rocky slopes of Caño Santa Lucia just east of Chachapoyas, alt. 2000-2400 m., May 28, 1962, *J. J. Wurdack* 602 (US, type; USM). Cultivated by Marie L. Wurdack, 1963.

PUYA RAMOSA L. B. Smith, sp. nov.

A *P. lehmanniana* L. B. Smith, cujus inflorescentiam imitans, pedicellis magnis bracteas florigeras subaequantibus differt.

Flowering 3-4 m. high (! Wurdack); leaves ca. 8 dm. long; blades narrowly triangular, attenuate, pungent, 4 cm. wide, covered beneath with subappressed cinereous scales, glabrous above, laxly serrate with antrorse flat pale 6 mm. long spines; scape erect, 4 cm. in diameter, soon glabrous; lower scape-bracts subfoliaceous, densely imbricate, the upper deciduous, unknown but probably similar to the primary bracts; inflorescence very laxly bipinnate, densely whitish-lanate except the petals and the old bracts; primary bracts ovate, acuminate, ca. 5 cm. long, much shorter than the usually naked sterile bases of the branches, dark brown, becoming nearly glabrous; branches spreading, to 3 dm. long, lax except at apex, 10 mm. in diameter; floral bracts broadly ovate, acute, 20-30 mm. long, about equaling the stout obconic pedicel; sepals broadly elliptic-oblong, broadly rounded at apex, 40 mm. long; petals naked, 70 mm. long, green. Pl. III, fig. 1: Branch of inflorescence x 1/4; fig. 2: Sepal x 1.

PERU: AMAZONAS: Prov. Chachapoyas: Locally frequent, approaches to Cerro Campanario north-northeast of Diosan, alt. 3200-3500 m., August 3, 1962, J. J. Wurdack 1600 (US, type; USM).

PUYA WURDACKII L. B. Smith, sp. nov.

A *P. pyramidata* (R. & P.) Schult. f., cui affinis, foliorum laminis longioribus angustioribus subtus dense lepidotis, sepalis lineari-lanceolatis differt.

Flowering 1 m. high; leaves many in a dense spreading rosette, 3 dm. long; sheaths reniform, 5 cm. wide, glabrous, entire, pale except for the dark castaneous apex; blades very narrowly triangular, attenuate, pungent, 12-15 mm. wide at base, covered beneath with appressed brown-centered white scales, glabrous and rather lustrous above, laxly serrate with subspreading straight slender brown 6 mm. long spines; scape erect, slender, very sparsely white-stellate; scape-bracts erect, exceeding the internodes, the lower subfoliaceous, densely imbricate, the upper suborbicular with a narrowly triangular blade, pectinate-serrate, small and exposing much of the scape, thin-coriaceous, dark brown, sublustrous to dull, very sparsely white-stellate; inflorescence simple, straight, 30-35 cm. long, lax except at apex, sparsely and obscurely white-stellate; floral bracts like the upper scape-bracts, about equaling the sepals; pedicels slender, 10 mm. long; flowers completely reflexed after anthesis; sepals linear-lanceolate, obtuse, 25 mm. long, white-lanate at apex; petals naked, 45 mm. long, green. Pl. III, fig. 3: Floral bract and flower x 1/2; fig. 4: Sepal x 1.

PERU: AMAZONAS: Prov. Bongará: Terrestrial, locally frequent, Jalca zone along Yambrasbamba-Pomacocha trail between Yanayacu and Pomacocha, alt. 2300-2400 m., June 26, 1962, J. J. Wurdack 1066 (US, type; USM).

TILLANDSIA CARNOSA L. B. Smith, sp. nov.

A *T. rauhii* L. B. Smith, cui valde affinis, foliorum laminis acuminatis, spicis longe stipitatis differt.

Flowering 1-2 m. high with the nutant inflorescence extended; leaves many in a dense rosette (! Wurdack), over 9 dm. long, covered throughout with appressed cinereous scales; sheaths elliptic, 25 cm. long, 14 cm. wide, dark castaneous; blades ligulate, acuminate, 8 cm. wide, flat, green; scape stout, decurved; scape-bracts subfoliaceous, strict, densely imbricate and completely covering the scape; inflorescence pendent, very laxly bipinnate, red-tinged (! Wurdack), essentially glabrous on the outer surfaces but the inside of the bracts and sepals subdensely brown-lepidote; primary bracts ovate, acuminate, to 8 cm. long; branches spreading, to 55 cm. long, the sterile base about twice as long as the spike, laxly bracteate; spikes lance-oblong, 18 cm. long, 6 cm. wide, very densely 24-flowered, strongly complanate; rhachis nearly straight, stout, alate; floral bracts densely imbricate, oblong-elliptic, obtuse, to 5 cm. long, equaling or exceeding the sepals, ecarinate, fleshy (! Wurdack), strongly rugose-sulcate in drying; flowers short-pedicellate, not at all secund; sepals free, narrowly elliptic, obtuse, 42 mm. long, ecarinate, sulcate when dry; petals naked, purple, the blades elliptic, 22 mm. long; stamens and style slightly exserted at anthesis. Pl. III, fig. 5: Branch of inflorescence x 1/4; fig. 6: Sepal x 1.

PERU: AMAZONAS: Prov. Chachapoyas: Abundant on cliff faces, rocky slopes of Caño Santa Lucia just east of Chachapoyas, alt. 2000-2400 m., May 28, 1962, J. J. Wurdack 603 (US, type; USM).

Although technically the exserted stamens place T. carnosa in the subgenus Tillandsia, the petals are not tightly rolled into a tube as in that subgenus but are much more like those in the subgenus Allardtia.

TILLANDSIA CUSPIDATA L. B. Smith, sp. nov.

A T. tetrantha R. & P., cui affinis, inflorescentiae ramis strictis bracteas primarias multo superantibus, bracteis sepalisque cuspidatis differt.

Flowering 6.5-9 dm. high; leaves about 12 in a tubular rosette, 35-50 cm. long, completely covered with appressed cinereous scales; sheaths broadly elliptic, 25 cm. long, 16 cm. wide, dark castaneous; blades ligulate, acute, 8 cm. wide, flat, green; scape erect, ca. 7 mm. in diameter at the middle, covered with pale ferruginous stellate persistent scales; scape-bracts broadly ovate with a small recurved apiculus, shorter than the upper internodes, densely lepidote; inflorescence slenderly cylindric, bipinnate, interrupted at base, elsewhere very dense, except for the petals covered with pale ferruginous stellate scales, dull salmon (! Wurdack); axis slender, slightly flexuous; primary bracts like the scape-bracts, mostly much less than half as long as the axillary spikes; spikes strict, oblong, strongly complanate, 4 cm. long, 18 mm. wide, 12-16-flowered, sessile; rhachis slender, straight or nearly so; floral bracts broadly ovate with a soft curved apical cusp, 5-8 mm. long, slightly exceeded by the sepals, thin, ecarinate but with a strong dark median nerve; flowers subsessile, rarely if at all secund, spreading to reflexed; sepals free, asymmetric, oblong-elliptic, 8 mm. long including the curved excurrent cusp of the heavy midnerve; petals orange-yellow (! Wurdack), blades ovate, 4 mm. long; stamens included, Pl. III, fig. 7: Branch of inflorescence x 1; fig. 8: Sepal x 1.

PERU: AMAZONAS: Prov. Chachapoyas: Epiphytic, summit of Cerro Malcabal (Cerro Tumbe) 3-6 km. southwest of Molinopampa, alt. 2850-2900 m., July 20, 1962, J. J. Wurdack 1457 (US, type; USM).

TILLANDSIA DIFFUSA L. B. Smith, sp. nov.

A T. pallidoflavens Mez, cui habitu valde simulans, scapi bracteis remotis, inflorescentia densissime pallido-lepidota differt.

Stemless, flowering over 1 m. high; leaves about 20 in a subbulbous rosette, to 32 cm. long, covered with fine appressed cinereous scales; sheaths broadly elliptic, 8 cm. long, dark castaneous turning to purple at apex; blades subligulate, acuminate, 35 mm. wide, flat, purple-spotted; scape erect, 6 mm. in diameter, cinereous-lepidote becoming glabrous with age; scape-bracts subelliptic with a short recoiled apiculus, about half as long as the internodes, densely lepidote; inflorescence very laxly and amply tripinnate, over 5 dm. long, densely cinereous-lepidote except the petals; axis slender, slightly flexuous; primary bracts about equaling the sterile bases of the branches, like the scape-bracts; branches spreading-ascending, very slender, the lower ones to 18 cm. long and with 7 spikes; secondary bracts only about twice as large as the floral bracts; spikes spreading, very lax, the terminal ones to 6 cm. long and 19-flowered, the lateral considerably smaller; rhachis very slender, scarcely if at all flexuous but usually curved as a whole; floral bracts broadly ovate, acute, 5 mm. long, about equaling the sepals at anthesis, even, ecarinate; flowers spreading, subsessile; sepals free, asymmetric, broadly obovate, truncate, 4.5 mm. long; petals barely exceeding the sepals, white (! Wurdack), drying to yellow; stamens included. Pl. III, fig. 9: Spike x 1; fig. 10: Sepal x 1

PERU: AMAZONAS: Prov. Chachapoyas: Epiphytic, semi-xerophytic valley of Río Sonche near Sonche, alt. 1950-2000 m., July 31, 1962, J. J. Wurdack 1547 (US, type).

In my key to Tillandsia section Pseudo-Catopsis (Contr. Gray Herb. 89:16-19), this species falls next to T. micrantha, but actually it much more closely resembles T. pallidoflavens because of its acuminate leaf-blades, very lax non-flexuous spikes and stiffly spreading flowers.

TILLANDSIA LAMINATA L. B. Smith, sp. nov.

A T. pectinata André, cui aliquid affinis, foliorum laminis angustissime triangularibus, scapi bracteis omnibus longissime laminatis differt.

Flowering 1.3 m. high; leaves many, over 1 m. long, covered throughout with fine closely appressed whitish scales; sheaths ovate-elliptic, to 13 cm. long, dark castaneous; blades very narrowly triangular, caudate-attenuate, flat, to 28 mm. wide at base, green; scape straight or curved, to 2 cm. in diameter at base, very sparsely pale-lepidote, red-tinged; scape-bracts strict, imbricate but only partly covering the scape, very broadly ovate, 2 cm. long exclusive of the very long foliaceous blade, densely pale-lepidote; inflorescence subcylindric, laxly 3-pinnate, nearly 7 dm. long, soon glabrous except for the primary bracts; axis slender, nearly straight, red-tinged (! Wurdack); lower primary bracts like the scape-bracts with long blades exceeding the axillary branches, the upper bladeless, much reduced and scarcely different from the floral bracts; branches suberect, all but the uppermost divided near the base, to 9 cm. long; secondary bracts like the floral bracts; spikes lax at base, subdense toward apex, about 10-flowered; rhachis flexuous, strongly flattened, wholly exposed; floral bracts distichous, becoming more or less downwardly secund with the flowers, broadly ovate, obtuse, 7 mm. long, convex, often bicarinate at base, strongly nerved; pedicels stout, angled, ca. 7 mm. long; flowers suberect at first and sometimes remaining so; sepals free, asymmetric, broadly obovate, truncate, 10 mm. long, strongly nerved, the margin dark purple when dry; capsule slenderly fusiform, 2 cm. long, Pl. III, fig. 11: Branch of inflorescence x 1/2; fig. 12: Sepal x 1.

PERU: AMAZONAS: Prov. Chachapoyas: Epiphytic, scrub forest along Río Ventilla 1-2 km. west of Molinopampa, alt. 2350-2400 m., July 23-25, 1962, *J. J. Wurdack* 1502 (US, type; USM).

TILLANDSIA WAGNERIANA L. B. Smith, sp. nov.

A *T. hamaleana* E. Morr., cui valde affinis, bracteis florigeris roseis apice valde incurvatis, petalis minoribus differt.

Flowering 4 dm. high; leaves ca. 4 dm. long, covered with fine pale appressed scales; sheaths elliptic, 8 cm. long, castaneous; blades ligulate, acute, 35 mm. wide, flat, becoming more or less glabrous above; scape erect, slender, glabrous; scape-bracts erect, much exceeding the internodes but not wholly covering the scape, broadly ovate, acuminate; inflorescence laxly bipinnate, 16 cm. long; primary bracts like the scape-bracts, barely exceeding the short bracteate sterile bases of the branches; spikes divergent, linear-lanceolate, acute, to 10 cm. long, 2 cm. wide, strongly complanate, densely many-flowered or sublax at base; floral bracts ovate, acute, to 23 mm. long, slightly exceeding the sepals, carinate and strongly incurved at apex, thin, nerved when dry, glabrous, pink (! Moore); flowers subsessile; sepals equally very short-connate, lance-oblong, acute, 21 mm. long; petals blue (! Moore), the blades spreading, broadly elliptic, 9 mm. long; stamens deeply included, exceeding the pistil. Pl. IV, fig. 1: Spike x 1/2; fig. 2: Sepal x 1; fig. 3: Petal and stamen x 1.

PERU: Vicinity of Iquitos, *Lee Moore* 310 (US, type, cultivated by David Barry, Jr.). At the request of Lee Moore, this species is dedicated to the memory of his friend, Ronald Thomas Wagner.

TILLANDSIA WURDACKII L. B. Smith, sp. nov.

A *T. orbicularis* L. B. Smith, cui verisimiliter affinis, inflorescentia laxa, spicis patentibus submultifloris bracteas primarias plerumque superantibus differt.

Stemless, flowering 5-15 dm. high; leaves many in a funnelform rosette, 55 cm. long; sheaths broadly oblong-elliptic, merging with the blades, ca. 25 cm. long, 11 cm. wide, dark castaneous beneath, black-purple above; blades narrowly triangular, ca. 6 cm. wide, flat, covered beneath with pale cinereous scales, green and glabrous above; scape erect, stout, obscurely lepidote, wholly covered by the erect densely imbricate subfoliaceous scape-bracts; inflorescence laxly bipinnate, about as long as the scape, glabrous except for the blades of the lower primary bracts, deep red to scarlet except the petals (! Wurdack); axis stout, nearly straight; lower primary bracts like the scape-bracts, longer or shorter than the spikes, upper primary bracts suborbicular and apiculate, less than half as long as the spikes; spikes spreading, lance-oblong to elliptic, 7-9 cm. long, 2-3 cm. wide, strongly complanate, densely 7-9-flowered, the short sterile base naked or rarely with a single sterile bract at apex; floral bracts densely imbricate and concealing the rhachis and sepals, broadly elliptic, subacute, to 34 mm. long, coriaceous, even, strongly carinate; flowers subsessile; sepals oblong, obtuse, 28 mm. long, the posterior very short-connate; petals pink with white apex (type, ! Wurdack) or purple-pink (paratype, ! Wurdack); stamens included, filaments straight. Pl. IV, fig. 4: Spike x 1/2; fig. 5: Posterior sepals x 1.

PERU: AMAZONAS: Prov. Chachapoyas: On trees, frequent, uppermost slopes and summit of Puma-urcu southeast of Chachapoyas, alt. 2900-3150 m., June 7, 1962, *J. J. Wurdack* 801 (US, type; USM). On tree limbs, frequent, moist scrub forest on south side of Molinopampa-Diosan pass, alt. 2700-3100 m., August 8, 1962, *J. J. Wurdack* 1646 (US, paratype; USM).

It becomes increasingly difficult and dangerous to describe novelties from the complicated maze of *Tillandsia* subgenus *Allardtia* that centers on the northern and central Andes. Ample collections, such as those of *T. wurdackii* above, show great variation in characters, and in this case break down the character of relative length of primary bracts and spikes that Mez and I have used as a major key heading.

In differentiating *T. wurdackii*, I have seized upon its most striking character, the strongly bicolorous triangular leaf-blades, and made a study of the species resembling it in this particular. So far they present several correlating traits, the spikes being dense and the floral bracts carinate. For what it is worth the following key presents the possible relationships of these species:

1. Sepals free or very short-connate posteriorly.
  2. Spikes with sterile bracts at base.
    3. Sterile base of the spike bracteate only at apex, mostly naked; spikes spreading. Costa Rica, Panama. *T. deppeana* var. *costaricensis*
    3. Sterile base of spike wholly bracteate; spikes suberect. Ecuador..*T. arguta*
  2. Spikes floriferous to base (or sometimes the lowest with a single bract) and without sterile bracts.
    4. Spikes spreading, rather many-flowered, mostly longer than the primary bracts; inflorescence lax. Peru..*T. wurdackii*
    4. Spikes erect, 4-5-flowered, mostly shorter than the primary bracts; inflorescence densely ellipsoid. Colombia, Ecuador...................................*T. orbicularis*
1. Sepals at least half-connate posteriorly.
  5. Inflorescence lax; primary bracts shorter than the spikes.

Colombia, Ecuador, Peru, Bolivia................*T. confinis*
5. Inflorescence dense.
  6. Primary bracts shorter than the spikes; inflorescence digitate. Colombia..............................*T. suescana*
  6. Primary bracts exceeding most of the spikes.
    7. Lower primary bracts triangular-ovate, long-attenuate. Ecuador.................................*T. confertiflora*
    7. Lower primary bracts broadly elliptic, apiculate. Colombia.................................*T. dichrophylla*

VRIESEA TILLANDSIOIDES L. B. Smith, sp. nov.

A *V. harmsiana* (L. B. Smith) L. B. Smith, cui valde affinis, spicis paucifloris fere omnino occultis, bracteis florigeris dense lepidotis tenuibus ad apicem nervatis, sepalis minoribus differt.

Flowering about 3 dm. high; leaves rosulate, many, 35 cm. long, cinereous-lepidote throughout; sheaths broadly ovate, ca. 5 cm. long, dark castaneous; blades very narrowly triangular, attenuate, 3 cm. wide at base, arched-recurving, subinvolute; scape erect, short, mostly concealed by the leaves; scape-bracts densely imbricate, ovate with long recurving foliaceous blades, green; inflorescence densely bipinnate, slenderly fusiform, 13 cm. long, 2 cm. in diameter; primary bracts elliptic, ample, laminate or apiculate, 5 cm. long, imbricate and covering the spike except for the corollas, subchartaceous, rose, covered with fine appressed cinereous scales; spikes sessile, elliptic, complanate, 35 mm. long, 15 mm. wide, densely 5-7-flowered; rhachis alate; floral bracts lanceolate, acute, to 23 mm. long, exceeding the sepals, sharply carinate, densely cinereous-lepidote, thin, nerved toward apex; flowers subsessile; sepals oblong-elliptic, acute, 15 mm. long, ecarinate, glabrous; petals tubular-erect, green, bearing 2 acute scales near base; stamens exserted. Pl. IV, fig. 6: Spike x 1; fig. 7: Sepal x 1.

PERU: PIURA: On trees, near Huancabamba, September 1956, *W. Rauh* P-304 (US, type). Cultivated and flowered in Heidelberg, West Germany, in 1962.

BOLIVIA

TILLANDSIA CONFINIS L. B. Smith, Phytologia 4:218, pl. 2, figs. 5-7. 1953.

Tillandsia subtropicalis L. B. Smith, Phytologia 8:505, pl. 3, figs. 8-10. 1963.

In making a revision of the species of *Tillandsia* subgenus *Allardtia* with bicolorous triangular leaf-blades (see under Peru - *Tillandsia wurdackii* above), I find that *T. subtropicalis* is no more than a reduced form of *T. confinis*.

BRAZIL

CANISTRUM TRIANGULARE Smith & Reitz, sp. nov.

A *C. aurantiaco* E. Morr., cujus habitum sepalaque simulans, foliorum laminis anguste triangularibus, scapi bracteis serrulatis, inflorescentia lepidota differt.

Known only from separate leaves and flowering shoot, plant over 3 dm. high; leaves 3 dm. long; sheaths elliptic, 14 cm. long, entire except at apex, dark purple except near base, subdensely vestite with fine brown appressed scales; blades narrowly triangular, attenuate, pungent, 3 cm. wide, covered with appressed brown-centered cinereous scales, becoming glabrous especially above; scape straight, 4 mm. in diameter, ferruginous-lepidote to sublanate; scape-bracts erect and enfolding the scape, elliptic, apiculate, serrulate, ferruginous-lepidote, the upper imbricate; inflorescence very densely subcorymbose, 5 cm. in diameter including the bracts, many-flowered; outer bracts suberect, broadly ovate, exceeding the flowers, entire, red, subdensely appressed-lepidote; floral bracts oblong-elliptic, acute, mucronate, slightly exceeding the sepals, thin, obscurely lepidote; sepals free, asymmetric, oblong, truncate and mucronate, 14 mm. long, strongly nerved, obscurely lepidote; petals and stamens unknown; ovary cylindric; placentae elongate; epigynous tube crateriform, 4 mm. high. Pl. IV, fig. 8: Apex of leaf x 1/2; fig. 9: Inflorescence x 1/2; fig. 10: Sepal x 1.

BRAZIL: ESPIRITO SANTO: Epiphytic, Castelo, Forno Grande, December 6, 1956, E. Pereira 2246 (HB, type).

NIDULARIUM SEIDELII Smith & Reitz, sp. nov.

Ab omnibus speciebus Nidularii scapo subnudo cum inflorescentia elongata differt.

Stemless, flowering 35-40 cm. high; leaves rather many in a broadly funnelform rosette, 5-6 dm. long, much exceeding the inflorescence; sheaths elliptic, 12 cm. long, entire, densely vestite with appressed brown-centered cinereous scales; blades ligulate, broadly subacute and apiculate, slightly narrowed at base, to 4 cm. wide, obscurely lepidote; scape erect, 6 mm. in diameter, nearly naked, finely ferruginous-lanate becoming more or less glabrous; scape-bracts 2, remote, the upper broadly ovate, ca. 35 mm. long, serrulate, lepidote; inflorescence subcylindric, 11-15 cm. long, 5 cm. wide; primary bracts suberect and densely imbricate, like the upper scape-bract but larger, to 45 mm. long, much exceeding and concealing the flowers, yellow; branches pulvinate, few-flowered; floral bracts elliptic, acute, about equaling the sepals, thin, entire, sparsely lepidote; flowers sessile, pale-ferruginous-lanate toward base; sepals broadly spatulate, truncate and mucronulate, slightly asymmetric, 14 mm. long, connate for 2.5 mm., prominently nerved; petals connate by their claws, naked, the blades elliptic, obtuse, 10 mm. long, white (! Seidel); stamens included; epigynous tube broadly funnelform, 1.5 mm. high; placentae apical. Pl. IV, fig. 11: Scape and inflorescence x 1/2; fig. 12: Sepal x 1; fig. 13: Open corolla and stamens x 1.

BRAZIL: SÃO PAULO: Near Ubatuba, A. Seidel 6-20 (HB, type; US)

Plate I

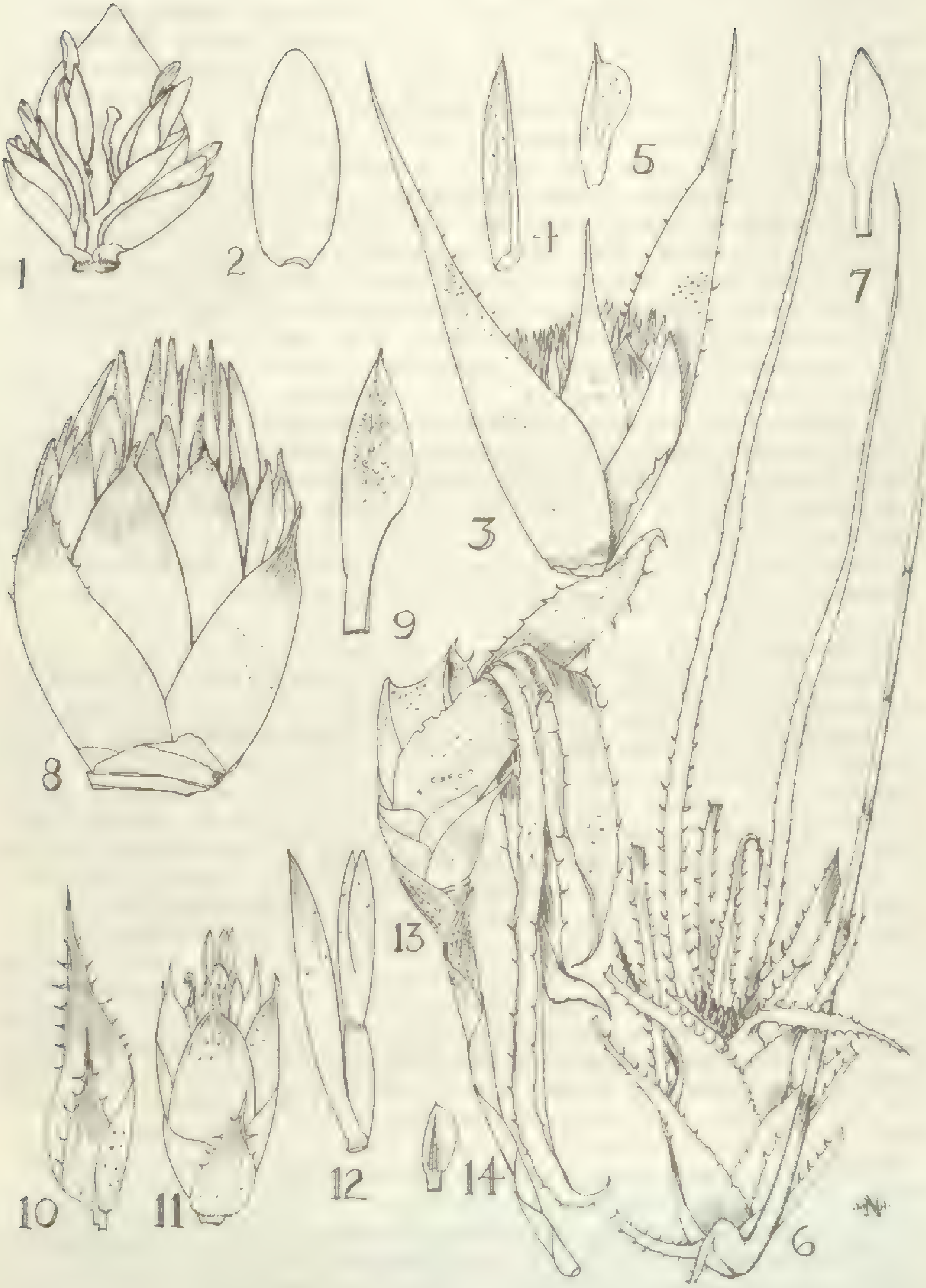

Fig. 1, 2: Vriesea ranifera; fig. 3-5: Neoregelia wurdackii; fig. 6, 7: N. pendula var. pendula; fig. 8, 9: N. rosea; fig. 10-12: N. peruviana; fig. 13, 14: N. stolonifera.

Plate II

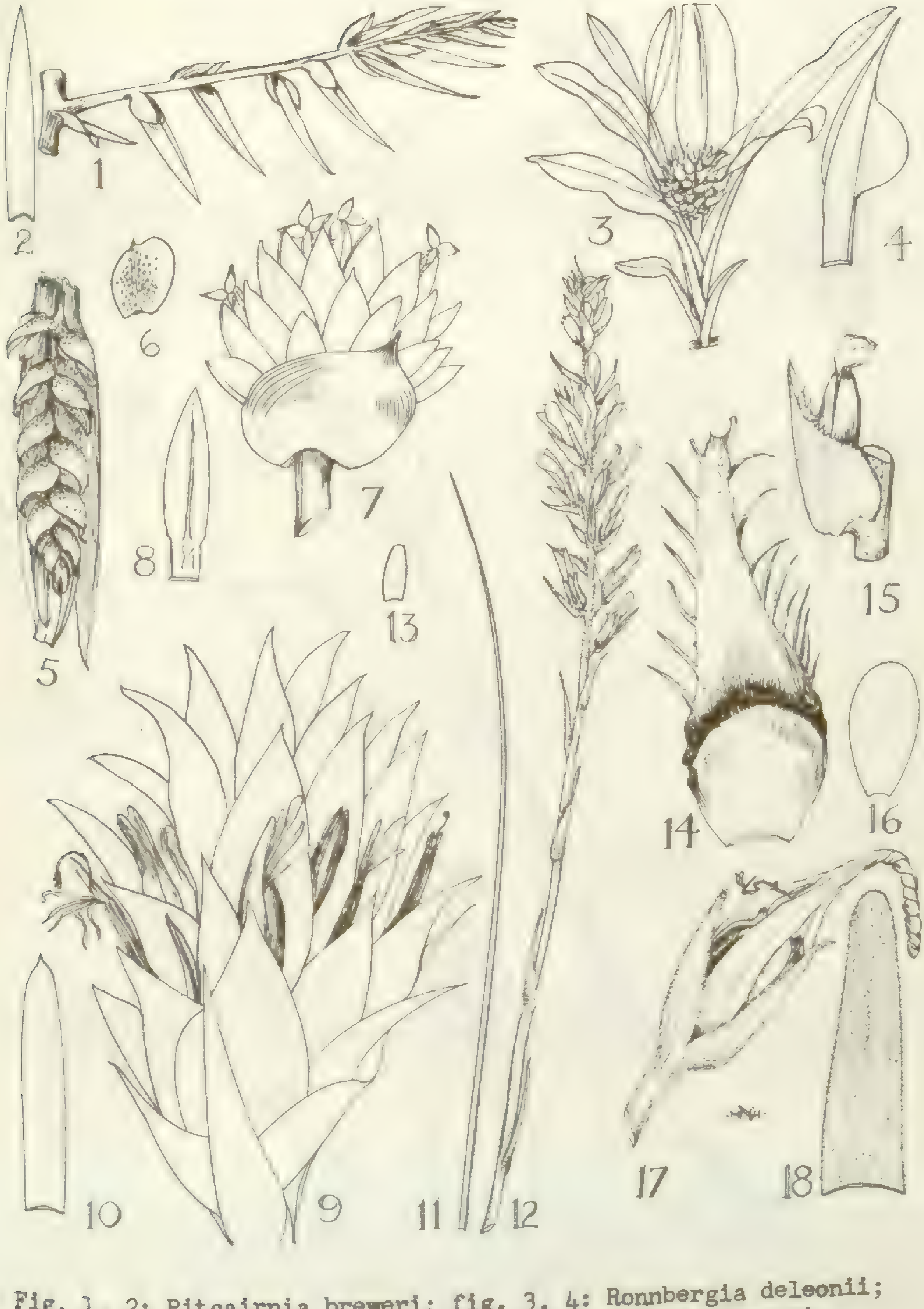

Fig. 1, 2: Pitcairnia breweri; fig. 3, 4: Ronnbergia deleonii; fig. 5, 6: Tillandsia gilmartiniae; fig. 7, 8: Guzmania xipholepis; fig. 9, 10: Pitcairnia clavata; fig. 11-13: P. melanopoda; fig. 14-16: Puya fulgens; fig. 17, 18: P. mariae.

Plate III

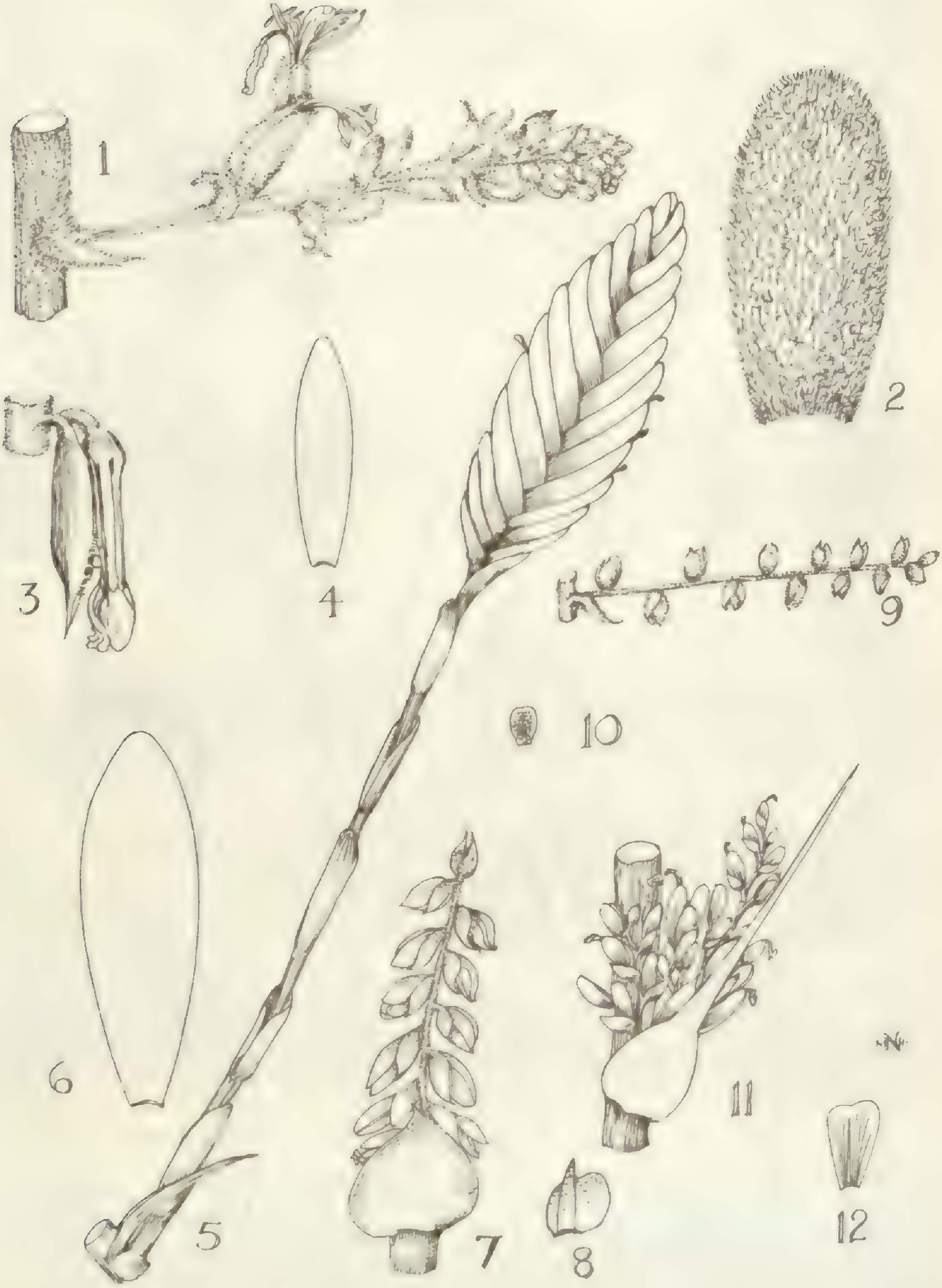

Fig. 1, 2: Puya ramosa; fig. 3, 4: P. wurdackii; fig. 5, 6: Tillandsia carnosa; fig. 7, 8: T. cuspidata; fig. 9, 10: T. diffusa; fig. 11, 12: T. laminata.

Plate IV

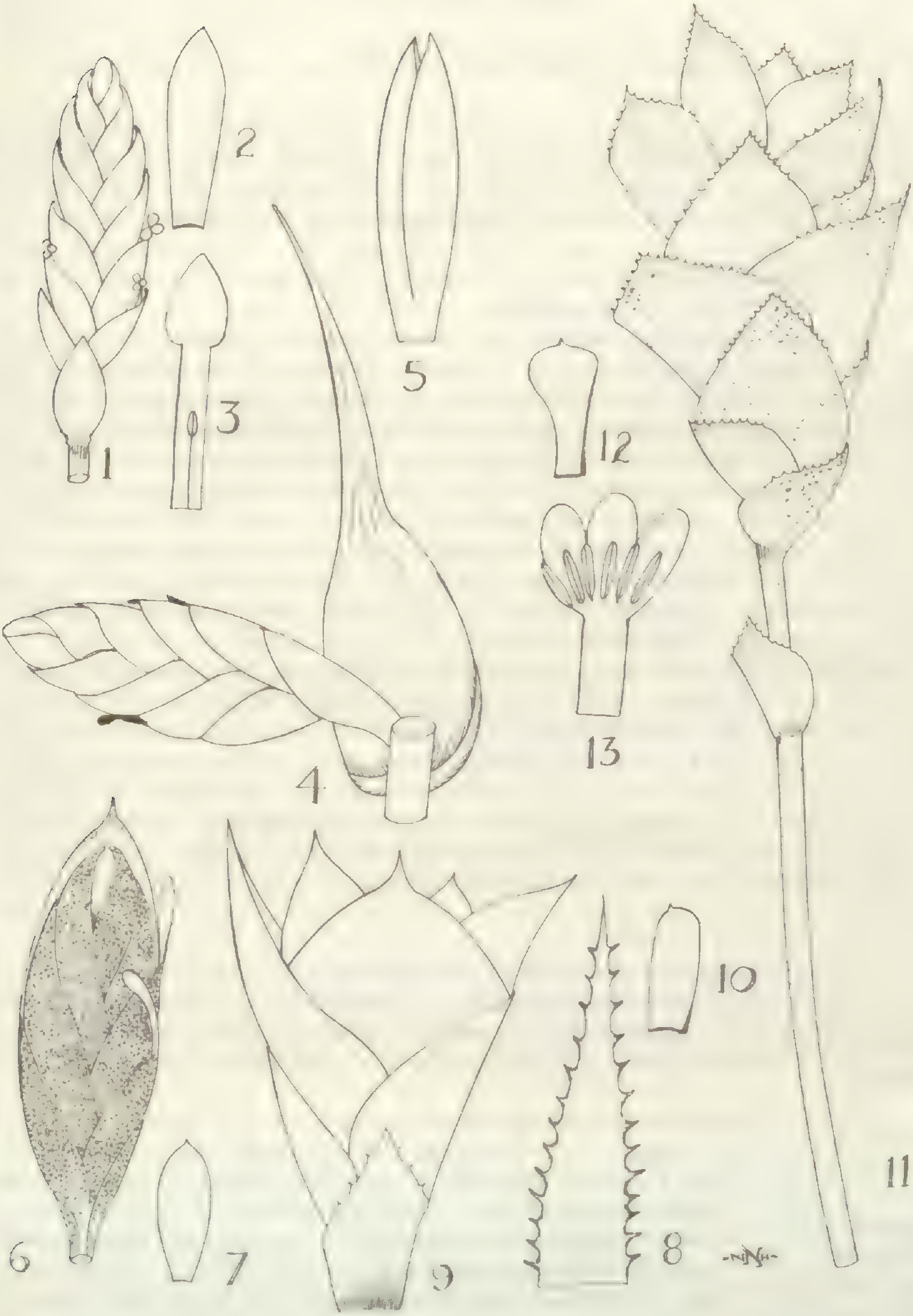

Fig. 1-3: Tillandsia wagneriana; fig. 4, 5: T. wurdackii; fig. 6, 7: Vriesea tillandsioides; fig. 9, 10: Canistrum triangulare; fig. 11-13: Nidularium seidelii.

SYNOPSIS OF AMERICAN VELLOZIACEAE

SUPPLEMENT III

Lyman B. Smith

Collections received from Dr. G. Pabst of the Herbarium Bradeanum and Dr. J. Murça Pires of the Universidade de Brasília have yielded further noteworthy Velloziaceae as follows:

6. **VELLOZIA SELLOVII** Seubert in Mart. Fl. Bras. 3, pt. 1:75. 1847, emend. L. B. Smith.

Short-caulescent, simple or few-branched; leaves 20-30 on each branch, densely fasciculate; sheaths ovate, 10 mm. long, closely and coarsely nerved, stramineous, lustrous, glabrous; blades long-persistent, linear, attenuate to a minutely obtuse apex, 4 cm. long, 2 mm. wide, conduplicate or splitting and appearing half as wide, laxly serrulate on the margins and beneath on the keel; glabrous; scape solitary, 25-40 mm. long, very slender, glabrous; ovary obconic or campanulate, 6 mm. long, smooth; tepals elliptic, obtuse, 18 mm. long, blue; stamens 6, 10 mm. long, the filaments triangular-dilated at base, unappendaged. Fig. 1: Plant; fig. 2: Tepal and stamen.

BRAZIL: Minas Gerais: Serra da Piedade, alt. 1800 m., March 27, 1957, *E. Pereira* 2677 *&* *Pabst* 3513 (HB, US).

It is a risky proceeding to emend a species without seeing its type, but in this case my only alternative is to describe the above material as new while being unable to separate it from the description of *V. sellovii* Seubert. Furthermore, Sellow collected in the area from which this later material came, so that it is not impossible that it is topotypic.

15b. **BARBACENIA IONANTHA** L. B. Smith, sp. nov.

A *B. irwiniana* L. B. Smith, cui valde affinis, omnibus partibus minoribus, tepalis purpureis, filamentis antheras superantibus differt. *B. brevifolia* Taub. in systema mea proxima sed scapis valde brevioribus, antheris sinum filamentorum superantibus differt.

Caudex incomplete in type but at least 15 mm. long; leaves numerous, densely massed, their order not evident; sheaths ovate, 15 mm. long, very closely nerved, glabrous; blades linear, acuminate, 4-7 cm. long, 5 mm. wide, closely nerved on both sides, sparsely denticulate on keel and margins, otherwise smooth and glabrous, strongly revolute; scape solitary, 7-9 cm. long, slender, bearing black stipitate glands especially near the apex; flowers purple (! Tórgo); perianth-tube 10 mm. long; ovary ellipsoid, the costae about 20, covered with black stipitate glands; epigynous tube infundibuliform, 4 mm. high; tepals suberect at anthesis, lanceolate, acute, 11 mm. long, the outer narrower; filaments 6 mm. long, the appendages joined to 1 mm. from their apices; anthers linear, over 5 mm. long, slightly exceeding the base of the filament-sinus; style exceeded by the anthers; stigmas linear, terminal. Fig. 3: Leaf-blade; fig. 4: Flower; fig. 5: Stamen (abaxial); fig. 6: Stamen (adaxial).

BRAZIL: Minas Gerais: Serra do Caparaó, near the two lakes, above the stone house, March 2, 1960, *Flávia Tórgo* 14 (HB, type).

21a. BARBACENIA INVOLUCRATA L. B. Smith, sp. nov.

B. fulva Goeth. & Henr. in systema mea proxima sed ab omnibus speciebus involucro magno haud foliaceo differt.

Caudex incomplete in the type but probably short; leaves numerous, densely rosulate; sheaths ca. 3 cm. wide, smooth, glabrous; blades very narrowly triangular, filiform-acuminate, to 27 cm. long, 10 mm. wide, subdensely antrorse-setose on the keel and margins, otherwise glabrous, closely nerved on both sides, recurved with age; scapes very short; flowers several in a terminal fascicle, each almost completely covered by an involucre of large scape-bracts; bracts elliptic, acute, enlarged in fruit to 11 cm. long, brown when dry, subchartaceous, glabrous; perianth-tube slenderly subclavate, to 75 mm. long, slightly constricted between the ovary and the 15 mm. long epigynous tube, covered with antrorse pyramidal-setose stramineous trichomes; tepals erect, oblong, acute, 28 mm. long; filaments quadrate with long lobes, 12 mm. long in all; anthers linear, 16 mm. long, about equaling the apex of the filament but extending well below its base. Fig. 7: Old flower and bracts; fig. 8: Tepal; fig. 9: Stamen (abaxial); fig. 10: Stamen (adaxial).

BRAZIL: Minas Gerais: Serra do Cipó, March 3, 1958, *Heringer & Castellanos* 5944 (US, type: Univ. Brasilia).

50a. BARBACENIA GRAMINIFOLIA L. B. Smith, sp. nov.

B. tomentosa Mart. in systema mea proxima sed scapo elatiore tubo epigyni tepalisque angustioribus differt. A *B. oxytepala* Goeth. & Henr., cui parum affinis, scapo altiore vestito, floribus minoribus differt.

Caudex incomplete in the type but probably short; leaves numerous, densely rosulate; sheaths broadly tubular-ovate, 2 cm. long, smooth, glabrous, stramineous; blades very narrowly triangular, filiform-acuminate, to 17 cm. long, 5 mm. wide, entire or nearly so, glabrous, closely nerved on both sides, recurved with age; scape terminal, solitary, very slender, glabrous toward base, toward apex subdensely vestite with fine crisp yellowish trichomes; perianth-tube very slenderly obconic or subcylindric, 40-50 mm. long, 5 mm. in diameter at apex, sparsely tomentose with scarcely glandular trichomes; epigynous tube 25-30 mm. long; tepals erect, oblong, broadly acute and apiculate, 17 mm. long; filaments triangular with short acute lobes, 2.5 mm. long in all; anthers linear, 11 mm. long. Fig. 11: Section of leaf-blade; fig. 12: Flower; fig. 13: Tepal; fig. 14: Stamen (adaxial).

BRAZIL: Minas Gerais: Serra do Cipó, March 3, 1958, *Heringer & Castellanos* 5950 (Univ. Brasilia, type).

American Velloziaceae

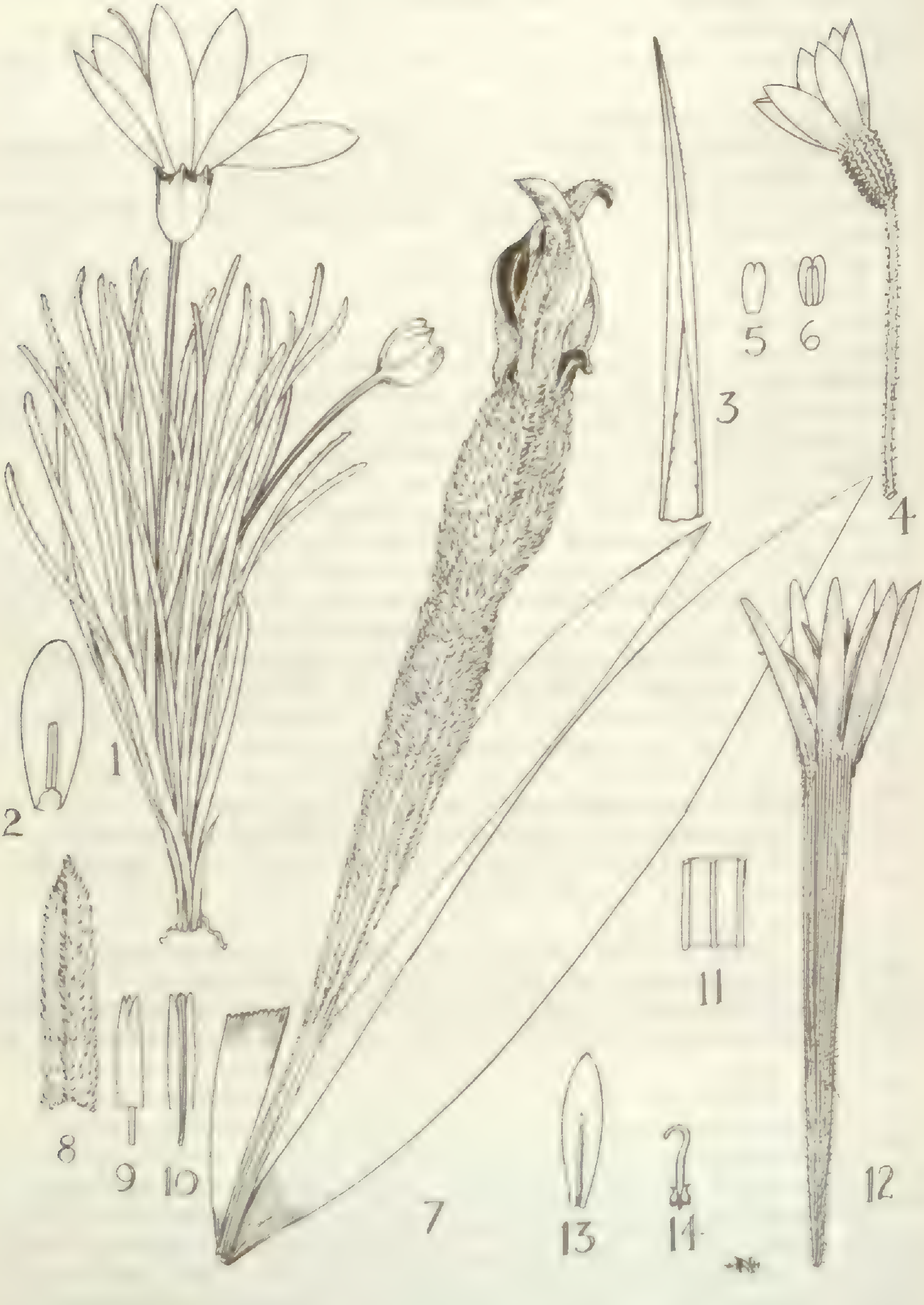

Fig. 1, 2: Vellozia sellovii; fig. 3-6: Barbacenia ionantha; fig. 8-10: B. involucrata; fig. 11-14: B. graminifolia.

Figure 10. Distribution of *Verbena hastata* in the United States

Herbarium curators who have material of this species from additional counties are asked to send it to the author for verification and record, so that future editions of this map may be more complete.

Mapping by counties done by Andrew R. Moldenke

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STUDIES ON INDIAN ACERS - II

A new variety of *Acer oblongum* Wall. from India.

M. L. Banerji
University of Kalyani, Kalyani, India.

Pax (1902) has mentioned five varieties of *Acer oblongum* Wall. of which var. *glaucum* Graf c. Schwerin is the most common and has a wide range of distribution; being from Kashmir to Central China. Another Indian variety is var. *microcarpum* Hiern, which is based on Griffith 935, collected from Mishmi Hills. Two other varieties, *latialatum* and *concolor*, are restricted to Hupeh in Central China, while the fifth, var. *horizontale*, is based on a cultivated plant in the botanical garden at Florenz. The varietal differences designated by Pax are the leaf and fruit characters.

The widely distributed var. *glaucum*, which has leaves that are glabrous on the upper surface and glaucous beneath, has been carefully studied for its fruit characters. The fruits have wings which are 2.5 to 3.2 cm. long, generally 2.8 cm. when measured from the constriction at the base of the inner side to the tip; and at its widest point it measures 9 to 12 mm. The var. *microcarpum* has fruit wings just 1 cm. long, with a width of 4—5 mm.

None of the five varieties mentioned by Pax has thin membranous leaves. A specimen collected from Jharipani (Mussorie) has characteristically membranous leaves, and also the size of the alae of the fruit is shorter than that of var. *glaucum*. Material in the Central National Herbarium, Calcutta (CAL.) and in the Forest Herbarium, Dehra Dun (DD.) have been examined. In the Central National Herbarium two sheets of Mackinnon collected also from Mussorie, and with membarnous leaves, have been encountered. These specimens are floriferous and the floral structures are exactly like those of var. *glaucum*. It has, thus, been thought best to describe this material with thin membranous leaves as a new variety under *A. oblongum* Wall.

Acer oblongum Wall. in DC. Prodr. I: 593, 1824; Hiern in Hook. f. Fl. Brit. Ind. I: 693, 1875; Pax in Engler Bot. Jahrb. VII: 208, 1886; et Pfreich. 8: 31, 1902. (=*A. laurifolium* D. Don, Prodr. Fl. Nep. 249, 1825, *A. buzimbala* Buch.-Ham. ex D. Don, loc. cit.)

var. *membranaceum* var. nova.

Accedit ad var. *glaucum* multis in notis, ab eo tamen differt foliis membranaceis papyraceisve, alis fructuum minoribus nempe 2.3--2.5 cm. longis, 9--12 mm. ad medium latis.

Typus lectus ad Jharipani prope Mussoorie in montibus Himalaicis Occidentalibus ab expeditione Collegii Meerut die 29 martii anni 1957, et positus in CAL sub accessionis numero 331441; paratypi, *Mckinnon s.n.* lectus die 15 aprilis anni 1896 ad Mussoorie, et *Mckinnon s.n.* lectus die 3 aprilis anni 1898 eodemque in loco, servati in CAL, primus sine accessionis numero, alter vero sub accessionis numero 95962A.

Acer oblongum is an evergreen tree about 12—15 m. tall with glabrous, oblong, long-pointed leaves. Flowers in hairy corymbs, appear from February to April and fruits from April to July in the North Western Himalayas. Flowering and fruiting is late in the Eastern Himalayas. Distributed in the temperate Himalaya, 610—1820 m. (2,000—6,000 feet) above sea level.

This new variety approaches the typical variety *glaucum* in most of the characters but clearly differs in having thin membranous to papery texture of the leaves and in the small size of the fruit wings, which are 2.3—2.5 cm. long and in the middle are 9—12 mm. wide.

The author is deeply indebted to Rev. Fr. H. Santapau, Director of the Botanical Survey of India, for the Latin translation of the diagnosis of the new variety and for going through the paper and improving its quality.

NOTES ON NEW AND NOTEWORTHY PLANTS. XXXVIII

Harold N. Moldenke

PAEPALANTHUS LONGICAULIS var. GLABER Moldenke, var. nov.

Haec varietas a forma typica speciei foliis vaginisque pedunculisque glaberrimis recedit.

This variety differs from the typical form of the species in having its leaves, sheaths, and peduncles completely glabrous.

The type of the variety was collected by Ezechias Paulo Heringer & Castellanos (*no. 6096*) in the Serra de Cipó, Minas Gerais, Brazil, on March 4, 1958, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York.

TRIPTEROCALYX MICRANTHUS f. ALBUS Moldenke, f. nov.

Haec forma a forma typica speciei floribus fructeisque albis recedit.

This form differs from the typical form of the species in having its flowers and fruits, including the membranous wings, white.

The type of the form was collected by Andrew Ralph Moldenke (*no. 635*) on the dry desert at Bingham, Socorro County, New Mexico, on August 14, 1963, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York.

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XIII

Harold N. Moldenke

VERBENA HASTATA L.

Additional citations: ILLINOIS: Union Co.: Fuller & Fisher 299 (Il--15881), 674 (Il--15900). Vermilion Co.: G. N. Jones 13010 (Ur); Storm s.n. [July 28, 1949] (Ur, Ur, Ur). Wabash Co.: Ahles 4637 (Ur); Schneck s.n. [Aug. 6, 1888] (Ur), s.n. [Aug. 12, 1889] (Ur), s.n. [July 5, 1900] (Ur), s.n. [July 1900] (Ur); Shearer s.n. [Mt. Carmel, July 20, 1900] (Vi). Wayne Co.: L. Carter 14114 (Il--24943); M. Walker s.n. [Sept. 10, 1949] (Ur); Winterringer 3248 (Il--28508). White Co.: Winterringer 3628 (Il--28831), 3645 (Il--28842), 3755 (Il--29142), 7775 (Il--37418). Whiteside Co.: Ahles 4203 (Ur); V. H. Chase 12952 (Ur); Winterringer 2924 (Il--27749). Winnebago Co.: E. W. Fell 51402 (Il--38331). Stony Island: F. W. Johnson s.n. [Stony Island, 7-19-13] (N). County undetermined: J. McCree 903 (Ur); Umbach 4059 [Wheatland] (Ca--441526). INDIANA: Allen Co.: C. C. Deam 40982 (Dm). Bartholomew Co.: Friesner 12973 (Bt--41434). Blackford Co.: C. C. Deam 181 (Dm). Boone Co.: McCoy 5292 (Bt--52109). Brown Co.: C. C. Deam 41445 (Dm); Friesner 1167 (Ew), s.n. [Trevlac, 7/19/30] (Bt--5099, Bt--5100). Carroll Co.: Daily s.n. [Lake Freeman, 8-16-1936] (Bt--32246); C. C. Deam 49299 (Dm). Clay Co.: Friesner 21768 (Au, Au, Mi, Ob--201962, Ok, S). Clinton Co.: Ek s.n. [8-27-1941] (Bt--61038). Dearborn Co.: Friesner 12528 (Bt--41913). Dubois Co.: C. C. Deam 52652 (Dm). Elkhart Co.: C. C. Deam 20993 (Dm); Friesner 15608 (Bt--54622). Fayette Co.: Knipe s.n. (In--2506). Floyd Co.: C. C. Deam 41551 (Dm); Friesner s.n. [8-23-23] (Bt--2466). Fountain Co.: C. C. Deam 53103 (Dm). Franklin Co.: S. McCoy 4171 (Dp--4664). Fulton Co.: Friesner 12580 (Bt--42389). Gibson Co.: S. McCoy 1473 (Dp--4670). Grant Co.: C. C. Deam 49338 (Dm). Greene Co.: Friesner 6512 (Bt--14218), 22187 (S), 22294 (Ok); Gheen s.n. (In--2321); Weatherwax s.n. (In--1018). Hamilton Co.: C. C. Deam 53038 (Dm); Friesner 11636 (Bt--37994). Hancock Co.: Friesner 18613 (N). Henry Co.: Black 36-7099 (Be--47804). Howard Co.: Ek s.n. [8-1-1939] (Bt--56802). Jasper Co.: C. C. Deam 42082 (Dm); Friesner 14565 (Bt--50399); Welch 124 (Dp). Jefferson Co.: C. C. Deam 50850 (Dm). Jennings Co.: C. C. Deam 37087 (Dm); S. McCoy 412 (Dp--4672). Knox Co.: C. C. Deam 29287 (Dm); S. McCoy 5349 (Bt--51726). Kosciusko Co.: C. C. Deam 384 (Dm); Doddridge 615 (Pu), 684 (Pu); Friesner 12659 (Bt--41421); M. Morris 166 (Ea); Templeton 115 (Pu); Umbach 1145 (Ka--62420). Lagrange Co.:

C. C. Deam 32480 (Dm); Friesner 12419 (Bt--41866). Lake Co.: C. C. Deam 1468 (Dm); F. W. Johnson 391 (N, W--1653653); Lansing 2805 (Up, Ur, W--753089). Laporte Co.: C. C. Deam 7063 (Dm), 21126 (Dm); Friesner 13840 (Bt--47129, Bt--47140), 14200 (Bt--47725). Lawrence Co.: Kriebel 953 (Bt--19476). Madison Co.: Friesner 17408 (Bt--62701); S. McCoy 2237 (Dp--13913). Marion Co.: H. H. Bartlett s.n. [July 20, 1903] (Mi). Marshall Co.: C. C. Deam 34733 (Dm); Evermann 744 (W--357594); Scovell & Clark 744 [56] (Du--24181). Miami Co.: Ek s.n. [7-23-1936] (Bt--42532), s.n. [8-16-1936] (Bt--42531). Monroe Co.: C. C. Deam 41459 (Dm); Friesner 3200 (Bt--8706); Gullian s.n. [Ellettsville] (In--4226); Lipps s.n. [July 17, 1941] (Ok). Montgomery Co.: Grimes 242 (Dp), 627 (Dp). Newton Co.: C. C. Deam 21478 (Dm), 58511 (Dm, N, N, N); Friesner 14669 (Bt--50638); Loughridge 1365 (Bt--17892); M. McKee 1329 (Dp). Noble Co.: Craw 2546 (Bt--5502); C. C. Deam s.n. [July 21, 1904] (Dm); Friesner 8963 (Bt--27856). Pike Co.: C. C. Deam 52662 (Dm). Porter Co.: C. C. Deam 39518 (In); Friesner 6790 (Bt-16551). Pulaski Co.: C. C. Deam 46373 (In); Friesner 3452 (Bt--7742), 9768 (Bl--42323, Ca--597262, Cm, Gu--14737, H--41100, Io--146962, La, N, Pl--83176, St--9249, Ur, We). Putnam Co.: Friesner 17852 (Bt--67692); Grimes 654 (Dp). Randolph Co.: C. C. Deam 63025 (N). Scott Co.: C. C. Deam 34496 (In). Shelby Co.: S. M. Deam 13711 (In); Friesner s.n. [Morristown, 8/12/30] (Bt--5051, Bt--5052). Spencer Co.: C. C. Deam 37454 (In). Starke Co.: C. C. Deam 21100 (In); Friesner 10012 (Bt--33824, Bt--33825). Steuben Co.: C. C. Deam s.n. [August 11, 1903] (In); Friesner 15680 (Bt--54759). Sullivan Co.: Friesner 6614 (Bt--15441); S. McCoy 1265 (Dp--4673), B.26 (Bt--16425). Switzerland Co.: C. C. Deam 58145 (N). Tippecanoe Co.: Dorner 306 (Pu). Tipton Co.: S. M. Deam 13909 (In), s.n. [C. C. Deam 13623] (Pu). Union Co.: McDougal s.n. [8-18-1888] (Dp). Vanderburgh Co.: C. C. Deam 41677 (Dm). Vigo Co.: Friesner 6667 (Bt--14460). Wabash Co.: Friesner 16018 (Bt--53180). Wayne Co.: Aakick 167 (Ea); M. E. Chambers 153 (Ea); Creek 157 (Ea), 159 (Ea); H. Hudson 164 (Ea); L. J. King 1690 (Ea), 2403 (Ea), 2569 (Ea), 2570 (Ea), 2651 (Ea); Knipe s.n. (In-2505). Wells Co.: C. C. Deam s.n. [Sept. 13, 1896] (In). White Co.: C. C. Deam 39362 (In); Friesner 3443 (Bt--7364). Whitley Co.: C. C. Deam 49409 (In). County undetermined: J. H. Holmer 91 [King's Creek] (Ka). IOWA: Boone Co.: Pammel, Buchanan, & King 3872 (Io--31763); Pammel & Macklin s.n. [Aug. 1912] (Io--52726). Buchanan Co.: Bode s.n. [Lamont, Aug. 13, 1919] (Io--97036); L. H. Pammel 755 (Io--199822). Butler Co.: Whaley s.n. [July 24, 1918] (Io--138453). Cedar Co.: Fay 1126 (Ca--965063), 1320 (Vi). Cerro Gordo Co.: Cratty s.n. [Clear Lake, Aug. 9, 1918] (Io--95673); L. H. Pammel 14 (Io); Shimek s.n. [July 29--30, 1922]

(N). Chickasaw Co.: Pammel & Spiker 605 (Io--118829); Rolfs s.n. (Io--15321). Clarke Co.: Pammel & Pammel s.n. [Osceola, Sept. 26, 1924] (Io--114368). Clay Co.: A. Hayden 3002 (Io--149003), 3004 (Io--149005), 3008 (Io--148886, N), 3011 (Io--148889), s.n. [August 7, 1934] (N). Clayton Co.: L. H. Pammel 624 (Io). Clinton Co.: L. H. Pammel s.n. [Clinton, Sept. 10, 1924] (Io--116730). Decatur Co.: J. P. Anderson s.n. [July 13, 1903] (Io--52106). Dickinson Co.: Shimek s.n. [Aug. 19, 1909] (N), s.n. [Aug. 23, 1919] (Ur). Dubuque Co.: L. H. Pammel s.n. [Dubuque, 6/20/91] (Io--15302). Emmet Co.: Cratty s.n. [Armstrong, August] (Io--92223); Pammel & Fisk s.n. [Dolliver, July 6, 1926] (Io--126224). Fayette Co.: Fink 185 [July 19, 1894] (W--214903), 185 [Aug. 16, 1894] (W--219903), s.n. [Fayette, Aug. 1893] (Io--28698), s.n. [Fayette, July 19, 1899] (Io--26815). Floyd Co.: Arthur s.n. [Charles City, July 6, 1881] (Ah), s.n. [Charles City, 5/15/81] (Ah); H. N. Moldenke 7663 (N). Guthrie Co.: Fay 3629 (Ca--45356); L. H. Pammel 569 (Io--118719). Hamilton Co.: A. Hayden 10338 (Io--149577); Pammel & Zimmerman 304 (Io--118093). Hardin Co.: C. M. King s.n. [Steamboat Rock, 9-12-03] (Io--46231). Iowa Co.: Easterley 791 (We). Jasper Co.: Van Bruggen 1365 (N). Johnson Co.: P. Barker s.n. [Iowa City, 7-25-29] (Au); Loufek s.n. [Lake Macbride, June 1938] (Io--147647). Jones Co.: C. E. Bessey s.n. [Monticello, July 10, 1876] (Ua--11385). Louisa Co.: R. A. Davidson 2725 (W--2235842). Mitchell Co.: Cratty s.n. [Osage, July 17, 1918] (Io--77816); F. M. Tuttle 229 (Io--77516). Muscatine Co.: Estle & Brown s.n. [south of Muscatine, summer 1935] (Io--146429); Pammel, Kelsom, & Harlan s.n. [Jul. 20, 1919] (Io--95042); Shimek s.n. [July 21, 1923] (Ur), s.n. [Aug. 25, 1925] (N). Palo Alto Co.: Cratty s.n. [West Bend, Jul. 10, 1919] (Io--96034); L. H. Pammel s.n. [Lost Island, July 18, 1920] (Io--97806), s.n. [Jul. 18, 1920] (Io--97735). Poweshiek Co.: M. E. Jones s.n. [Grinnell, August 1875] (Po--71001); Macy-Noyes 211 (Ok--10356). Scott Co.: Hull s.n. [New Liberty, Sept. 28, 1913] (Io--74994); C. C. Parry s.n. [Davenport, July 1886] (Io); E. A. Ross s.n. [Davenport, July 1890] (Ca--199030); Suksdorf s.n. [July 20, 1873] (Pl--138423), s.n. [Aug. 2, 1874] (Pl--138423). Sioux Co.: Newell s.n. [Hull, 6-1895] (Io--20785). Story Co.: Beyer s.n. [Ames, August 1888] (Io--45075); P. Clayton 37 (Io--50263, Io--84555), 137 (Io--84554); A. S. Hitchcock s.n. [Ames, Aug. '82] (Io--15320), s.n. [Ames, 1889] (Io--15319); Jeffs s.n. [Ames, July 23, 1907] (Ok--10351), s.n. [Ames, 1907] (Io--75051); L. H. Pammel 78 (Io--50263, Io--74205), s.n. [Ames, 1894] (Io--54789); Pammel & Maxwell s.n. [Kelley, Sept. 1911] (Io--84557). Tama Co.: Pendry s.n. [Toledo, Jul. 26, 1920] (Io--97049). Van Buren Co.: Fults s.n.

[Keosauqua, July 1933] (Io--140891). Wapello Co.: L. H. Pammel s.n. [Eddyville, 9-16-12] (Io--76523). Winneshiek Co.: Goddard s.n. [6-20-95] (Io--72079); Holway s.n. [Decorah, Aug. 1, 1879] (Io--38755); Tolstead s.n. [July 11, 1933] (Ca--882657). Worth Co.: C. S. Wallis s.n. [Aug. 3, 1950] (St), s.n. [Aug. 21, 1950] (St). County undetermined: Cratty s.n. [13 July 1886] (Ob--50800); Somes 3490 [Butler's Landing] (W--672273). KENTUCKY: Bath Co.: Plymale s.n. [July 16, 1939] (Ky). Fayette Co.: C. W. Short s.n. (Pr). Henderson Co.: A. R. Moldenke 104 (Fg). Hopkins Co.: A. R. Moldenke 107 (Fg); Shacklette 620 (Bt--59308, Ky). Laurel Co.: Peter s.n. [Pittsburg, July] (Ky). Menifee Co.: F. T. McFarland 2314 (Ky); McFarland & Lyle 4094 (Ky). Powell Co.: F. T. McFarland 4410 (Ky, Um--236). Union Co.: Shacklette 531 (Ky, N). County undetermined: C. W. Short s.n. [1840] (W--264618), s.n. [1842] (W--771848), s.n. [Kentucky] (Lu). TENNESSEE: McNairy Co.: S. M. Bain 444 (C). MICHIGAN: Alger Co.: E. G. Voss 2486 (Mi). Arenac Co.: McVaugh 12471 (Mi). Berrien Co.: F. W. Johnson 1316 (N); Lansing 3241 (W--753381); Merkle s.n. [August 1939] (Ok). Calhoun Co.: Potzger s.n. [Duck Lake] (In--11170, In--11171). Charlevoix Co.: J. H. Ehlers 643 (Mi); Yuncker 1530 (Dp). Cheboygan Co.: J. H. Ehlers 1626 (Mi); Gates & Gates 9779 (Ur); Kofoid s.n. [Aug. 25, 1890] (Ob--50808); Swallen s.n. [Douglas Lake, July 1924] (W-1631173). Chippewa Co.: F. J. Hermann 7092 (Mi). Clinton Co.: Baumgras RL.40 (Mi). Eaton Co.: McClatchie s.n. [Olivet, July 11, 1888] (Du--123522); Toumey s.n. [Grand Ledge, July 19, 1891] (Ca-25146). Emmet Co.: J. H. Ehlers 1195 (Mi); F. C. Gates 12449 (Ka-65927); Gleason & Gleason 162 (Bt--30834, Dm, Go, N, We). Gogebic Co.: M. K. Clemens s.n. [Ironwood, July 28, 1909] (Gg--154581). Grand Traverse Co.: Dieterle 1329 (Mi), 1374 (Mi). Houghton Co.: C. D. Richards 1005 (Mi), 2696 (Mi, S), 3849 (Mi). Ingham Co.: L. H. Bailey s.n. [Lansing, Aug. 11, 1885] (Ba); C. F. Baker s.n. [Agric. College, 1890] (Po--63902); Cordley s.n. [East Lansing, 6-27-95] (Or--8860); E. B. Lake s.n. [7.27.88] (Or--8866), s.n. [8.4.88] (Or--8863); Yuncker 536 (Ur). Ionia Co.: C. F. Wheeler s.n. [Hubbardston] (Mi). Jackson Co.: Collector undesignated s.n. [Jackson, July 10, 1838] (Mi). Kent Co.: H. M. Bailey s.n. [Grand Rapids, Aug. 15, 1891] (Mi); Bazuin 3626 (Mi); Sones s.n. [July 27, 1892] (Pl--22627). Livingston Co.: Hamerstrom 192 (Mi); Raymond & Kucyniak 3075 (S). Luce Co.: E. G. Voss 2467 (Mi). Mackinack Co.: Allabach 49 (Cm); Potzger 4553x (Bt--21680). Mason Co.: Chaney 31 (Ca--216739), 81 (N). Menominee Co.: Grassl 2610 (Mi, N). Midland Co.: Dreisbach 7425 (Up). Monroe Co.: B. M. Robertson 224 (Mi). Oakland Co.: Ameel s.n. [Union Lake, Aug. 25, 1928] (Mi); Farwell s.n. [Franklin, Sept. 22, 1918] (Mi). Roscommon Co.:

Dreisbach 5299 (Gg--319619). Saginaw Co.: Dreisbach s.n. [24/7/1927] (Ew). Saint Clair Co.: C. K. Dodge s.n. [near Port Huron, 7-27-92] (Mi), s.n. [7/28/95] (Ob--87589), s.n. [Aug. 29, 1912] (Mi). Saint Joseph Co.: Hanes S.J.13 (Mi). Van Buren Co.: Lansing 3340 (W--753461). Washtenaw Co.: E. C. Almendinger s.n. [Ann Arbor, July 6, 1860] (Mi); D. Carter s.n. [July 1931] (Ok--10358); Collector undesignated s.n. [Ann Arbor, Aug. 17, 1916] (Mi); Dodder s.n. [July 1931] (Ok--10359); Frickelton s.n. [July 27, 1931] (Ok--10357); Friesner s.n. [Ann Arbor, 7-20-18] (Bt--2470), s.n. [Ann Arbor, 8-13-18] (Bt--2469); Gustafson s.n. [Ann Arbor, July 22, 1923] (Mi); Kauffman & Kanouse s.n. [July 29, 1923] (Ka--68880, Mi); C. D. LaRue s.n. [Ann Arbor, July 17, 1915] (Mi), s.n. [Ann Arbor, Sept. 4, 1915] (Mi); Podolski s.n. [July 25, 1917] (Mi); Walfrole s.n. [Aug. 7, 1918] (Mi); Whited 105 (Pl--22570), 2105 (Or--12380). Wayne Co.: B. F. Chandler s.n. [near Trenton, Aug. 13, 1914] (W--983198); Foote s.n. [Detroit, July 10, 1860] (Mi); Gillman s.n. (Br); Grassl 5905 (Mi); H. H. Rusby s.n. [Detroit, Aug. 1884] (Bz--23752, Se--14939); J. M. Sutton 689 (Mi); E. Wilkinson s.n. [W. Salem, July 31, 1887] (Mi). Sugar Island: F. J. Hermann 7251 (N). County undetermined: M. Craig 12074 [Mich. Agric. Coll.] (Ca--367852); Miller s.n. [Bass Lake, Aug. 12, 1928] (Gu--E.1048); Umbach 7111 [Magician Lake] (Au). WISCONSIN: Ashland Co.: E. Beals s.n. [June 21, 1959] (Ws); E. M. Christensen 3537 (Ws); Fassett 9534 (Ws); Ugent, Weber, & Zimmerman s.n. [September 2, 1959] (Ws). Bayfield Co.: Cheney 4328 (Ws); Fassett 8161 (Ws), 8164 (Ws); Horner s.n. [Sept. 5, 1955] (Ws); Shaughnessy & Shaughnessy s.n. [Oct. 3, '59] (Ws); Weber, Ugent, & Zimmerman s.n. [September 3, 1959] (Ws). Brown Co.: De Byle s.n. [3 Aug. 1952] (Ws, Ws); Halloin 181 (Ws); T. S. Kellogg s.n. [De Pere, August 1, 1888] (W--259280); P. O. Schallert 32 (H--5470); Shuette s.n. [Green Bay, Aug. 4, 1887] (N). Buffalo Co.: Fassett & Hotchkiss 3320 (Ws); H. H. Smith 7069 (B). Burnett Co.: Fassett 8163 (Ws); M. Johnson s.n. [Sept. 17, 1960] (Ws); W. T. McLaughlin s.n. [Sept. 1, 1929] (Ws); E. Newcomb s.n. [August 7, 1959] (Ws). Calumet Co.: Benke 386 (W--1521469); W. E. Rogers s.n. [July 6, 1932] (Ws); A. Smith 86 (Ws). Chippewa Co.: Bjerke 3 (Ws); T. A. Ebert s.n. [10 July 1960] (Ws). Clark Co.: Melchert s.n. [August 14, 1959] (Ws); J. M. Schmidt s.n. [August 1, 1958] (Ws); J. Wickham 33 (Ws). Columbia Co.: R. L. Burgess s.n. [July 27, 1959] (Ws); H. P. Chandler 348 (Ca--25180); Iltis & Koeppen 8160 (Ws); H. L. Russell 100 (Ws). Crawford Co.: H. H. Smith 7478 (B, Ws). Dane Co.: C. C. Albers 33018 (Au); Backus s.n. [Aug. 5] (Ws); N. L. Britton s.n. [Lake Mendota, Aug. 23, 1893] (C); W. H. Chase s.n. [Madison, 7/27/1877] (Ws), s.n. [7/29/1877]

(Ws); H. K. Henry 101 (Up); Herb. Univ. Wisc. s.n. [Sun Prairie, Aug. 29, 1893] (Ws); Hunter s.n. [Oct. 6] (Ws); G. N. Jones 17655 (Ur), 17712 (Ur); Lapham s.n. (Ws); L. H. Pammel s.n. [Madison, Sept. 1884] (Io--15346); R. F. Peters 144b (Ws); A. B. Seymour 1062 (H--107718, Ur); H. L. Smith s.n. [July 12, 1885] (Ws); Ugent s.n. [July 7, 1960] (Ws); S. W. Williamson s.n. [July 20, '86] (Ws). Dodge Co.: Bubbert s.n. [Aug. 1928] (Ws); Iltis & Koeppen 8557 (Ws, Ws); Martz s.n. [August 25, 1958] (Ws); J. W. Rhodes 371 (Ws); Shinners 728 (Ws). Door Co.: E. Anderson s.n. [July 14, 1956] (Ws); Lellinger 123 (Ur); McCabe s.n. [27 August 1945] (Ws). Douglas Co.: Thomson & Jacobson 5345 (Ws). Dunn Co.: F. A. Bachmann s.n. [Aug. 9, 1928] (Ws); Bachmann & Patrick s.n. [July 13, 1928] (Ws); Buss s.n. [July 29, 1940] (Ws); D. E. Meyer 23 (Ws); Rossler s.n. [Aug. 7, 1928] (Ws); Weinzirl s.n. [Aug. 7, 1892] (Ws). Eau Claire Co.: Kunz 198 (Ws). Florence Co.: Riffle s.n. [Aug. 1, 1960] (Ws). Fond du Lac Co.: P. Mueller s.n. [Sept. 25, 1960] (Ws); Parenteau s.n. [8/23/39] (Ws). Forest Co.: R. A. Elder s.n. [Argonne, 1936] (Ws). Grant Co.: Fassett 14282 (Ws); H. W. Graham s.n. [July 24, 1928] (Cm); Iltis, Long, & Rudolph 13794 (Ws); H. H. Smith 7680 (B, Ws); Wunderlin s.n. [July 11, 1960] (Ws). Green Co.: E. W. Fell 58-486 (Ws), 58-549 (Ws); Stuntz s.n. [Aug. 20, 1891] (Ws). Green Lake Co.: Kunz s.n. [Aug. 25, 1929] (Ws); R. F. Peters 144a (Ws, Ws); Ugent s.n. [July 14, 1960] (Ws). Iowa Co.: Berlin s.n. [Sept. 19, 1957] (Ws), s.n. [July 30, 1957] (Ws), s.n. [Aug. 28, 1957] (Ws); Iltis & Noamesi 7068 (Ws); A. M. Peterson 228 (Ws); H. H. Smith 6885 (B, Ws). Jefferson Co.: Alberts s.n. [Sept. 10/45] (Ws); G. V. Burger 83 (Ws); Kuhlman s.n. [Aug. 26, 1954] (Ws); Loewenberg s.n. [17.IX.60] (Ws); Metzner s.n. [Ft. Atkinson, July] (Ws); Schempf s.n. [July 25th '95] (Ws). Juneau Co.: B. O. Dodge s.n. [Sept. 1935] (N); Iltis & Noamesi 6931 (Ws, Ws); Lemke 129 (Ws); Wills s.n. [June 25, 1957] (Ws). Kenosha Co.: Grace 34 (Ok). Kewaunee Co.: Iwen 156 (Ws). La Crosse Co.: T. Hartley s.n. [Blue Lake marsh, 9/24/55] (W--2261658); L. H. Pammel s.n. [Holman, Jul. 27, 1923] (Io--111407); A. M. Peterson 170 (Ws), 325 (Ws). Lafayette Co.: Cheney s.n. [Aug. 20, 1889] (Ws); W. H. Manning s.n. [Shullsburg, July 24, 1883] (N); P. K. Nelson s.n. [22 July 1946] (Ws, Ws); Shinners 2356 (N, Ws); R. Wagner s.n. [8/8/59] (Ws). Lincoln Co.: Iwen 350 (Ws); Peroutky & Seymour 12271 (Ws); F. C. Seymour 15442 (Ws); R. Weber 38 (Ws). Manitowoc Co.: Iltis & Univ. Wisc. Botany 130 Class 14210 (Ws). Marathon Co.: Cheney 3082 (Ws); Schlising 706 (Ws); Schlising & Schlising 1038 (Ws). Marinette Co.: Iltis & Rudolph 14774 (Ws); Martz 156 (Ws, Ws), 173 (Ws), 223 (Ws, Ws); Ware s.n. [August 17, 1956] (Ws). Marquette Co.: Fassett 8795 (Ws); Hartwell s.n. [Germania] (Ws); Iltis, Bell, Melchert, Patman, & Witt 12361 (Ws); Iltis & Buckmann 11283 (Ws); Noamesi 6299 (Ws); Parenteau 32 (Ws). Milwaukee Co.: J. S. Douglas s.n. [Wis.] (Je—3158); Kremers s.n. [17.VII.86] (Ws, Ws); Lapham s.n. [Milwaukee] (Ws); Strong s.n. [Wauwatosa, July 26, 1891] (Mi). Monroe Co.: A. M. Peterson 49 (Ws). Oconto Co.: Gillman s.n. [July 26, 1868] (Pr); E. E. Honey s.n. [Keshena, July 11, 1934] (Ws); Schlising & Schlising 1017 (Ws). Oneida Co.: Cheney 1764 (Ws); F. W. Johnson 1053 bis (N). Outagamie Co.: Koeppen s.n. [9 July '55] (Ws). Polk Co.: Mrs. C. F. Baker s.n. [June '99] (Po—64654), s.n. [7-11-99] (Po—64655); Benner & Benner 328 (Ws); M. Johnson s.n. [Aug. 15, 1960] (Ws), s.n. [Aug. 26, 1960] (Ws); W. T. McLaughlin 1414 (Ws), s.n. [Aug. 26, 1929] (Ws); R. W. Pohl 466 (Ws). Portage Co.: Goder s.n. [July 1955] (Ws). Price Co.: Escoll 502 (B). Richland Co.: M. A. Fosberg 336 (Ws); H. P. Hansen 502 (Ws); Iltis & Salaman 9939 (Ws); Tutton s.n. [Aug. 13, 1959] (Ws). Rock Co.: E. W. Fell 57-643 (Ws), 57-734 (Ws), 57-736, in part (Ws), 57-739 (Ws), 57-801 (Ws). Rusk Co.: Iltis, Iltis, & Noamesi 7880 (Ws). Saint Croix Co.: W. T. McLaughlin 1412 (Ws); N. Russell s.n. [July 1948] (Ws). Sauk Co.: Iltis & Koeppen 11818 (Ws); Koeppen s.n. [August 28, 1956] (Ws); Schaars s.n. [August 17, 1958] (Ws); H. H. Smith 7906 (B, Ws); Umbach 12273 (Ws); J. H. Zimmerman 1174 (Ws). Sawyer Co.: Ugent, Weber, & Zimmerman s.n. [September 1, 1959] (Ws). Shawano Co.: Hein 66 (Ws); E. E. Honey s.n. [July 11, 1934] (It); Melchert s.n. [9/3/58] (Ws), s.n. [early July] (Ws). Sheboygan Co.: Goessl s.n. [July 1919] (Ws); Kuhlman s.n. [Sept. 16, 1954] (Ws, Ws). Taylor Co.: O. Anderson 139 (Ws). Trempealeau Co.: Iltis & Koeppen 11991 (Ws). Vernon Co.: Fassett 20234 (Ws); K. G. Foote s.n. (Ws); H. P. Hansen 129 (Ws); Melchert & Witt s.n. [Sep. 20, 1958] (Ws); H. H. Smith 7274 (Ws), 7366 (Ws); Stegner s.n. [Sept. 25, 1960] (Ws). Vilas Co.: Potzger 8750 (Bt—60877, Ws); Stearns 854 (Ws). Walworth Co.: Almon s.n. [East Troy, July 20, 1926] (Ws); Fernholz s.n. [August 24, 1929] (Ws); N. Hollister 53 (Gg—31328); Kleeberger s.n. [Whitewater, 7-19-1877] (Gg—31332); Wadmond 17734 (Ky, S). Washburn Co.: Fassett 8162 (Ws); W. T. McLaughlin 1413 (Ws), 1418 (Ws); H. Stephens s.n. [July 12, 1947] (Ws). Washington Co.: Grotjan 182 (Ws), 186 (Ws). Waukesha Co.: Cull 238 (Ws); Ehrler s.n. [Aug. 22, 1928] (Ws); Schulte s.n. [Sept. 1959] (Ws); Sheaffer s.n. [July 31, 1957] (Ws), s.n. [August 26, 1957] (Ws). Waupaca Co.: Melchert s.n. [early July] (Ws); Rill 42 (Ws), s.n. [July 16, 1959] (Ws); Ray White s.n. [June 23, 1957] (Ws). Waushara Co.: Doll s.n. [July 19, 1959] (Ws); Pochmann s.n. (Ws); Snell s.n. [August 17, 1957] (Ws). Winnebago Co.: M. M. James s.n. [Aug. 21, 1894] (Ws); Kaspar s.n.

[July 24, 1953] (Ws). Wood Co.: M. Johnson s.n. [July 23, 1960] (Ws); M. B. McMillan s.n. [Wisconsin Rapids, 1900] (Ws); Stolle s.n. [Nekoosa, Aug. 3, 1957] (Ws). County undetermined: Barnston s.n. [Lake Superior to L. Winnipeg] (Ws); R. Sprague s.n. [1926] (Cn). Farmer's Island: Botany 162 Class s.n. [Sept. 27, 1941] (Ws). Goose Island: Hartley 1375 (Ws). Manitou Island: F. C. Lane 2591 (Ws). MINNESOTA: Anoka Co.: Stoesz s.n. [1926] (Ob--70106). Becker Co.: Buell 2019 (H--71943, No--8612); M. L. Grant 3073 (Ca--438910, In, Io--139963, N, Ob--50796, Vt, W--1487037); Moyle 732 (Ca--882651). Cass Co.: Pammel & Pammel 669 (Io--58202). Clearwater Co.: Deaver 5355 (Fg--8455). Crow Wing Co.: E. B. Watson s.n. [Brainerd, 1902] (Io--45603). Douglas Co.: E. D. McDonald Jr. s.n. [July 11, 1940] (W--1888485). Goodhue Co.: Sandberg s.n. [Red Wing, Aug. 1885] (B). Hennepin Co.: F. H. Burglehaus 8461 (Se--14938); Daubenmire s.n. [8-1-33] (Bt--18491); Mearns 526 (C); J. H. Sandberg s.n. [Aug. 1889] (Ca--25145, Ca--25150). Itasca Co.: R. Bebb 4679 (Ok, Ok); J. H. Sandberg 712 (Fc--2280, Io--45137). Jackson Co.: Cratty s.n. [Heron Lake, Jul. 24, 1923] (Io--109586). Lake of the Woods Co.: Moore & Moore 10977 (Vi). Le Sueur Co.: Shunk & Manning 132 (W--1623243). Meeker Co.: H. L. Dale s.n. [July 13, 1925] (Du--150949). Mower Co.: J. F. Brenckle 47-547 (N, Si). Nicollet Co.: C. A. Ballard s.n. [Swan Lake, July 1892] (S, W). Ottertail Co.: Chandonnet s.n. [July 11, 1911] (Up-60383); P. Johnson 545 (Bt--63945, Ky, N). Pine Co.: Lakela 4170 (Pl--129894). Polk Co.: Childs s.n. [Aug. 7, 1898] (Ob--5083). Ramsey Co.: Buell 723 (No--8611); Mearns 526 (W--649507, W--649508), s.n. [Fort Snelling, August 31, 1891] (W--670316); Ramaley 351 (Bl--42322). Rice Co.: G. K. Knight s.n. [Northfield, 8/18/33] (Bt--31376). Saint Louis Co.: Clapper s.n. [Kelly Lake, 7-31-07] (Io--49039); Lakela 2108 (Ca--7027, H--56846, N, Pl--100355). Stearns Co.: J. E. Campbell s.n. [Rockville, July 1896] (N, Po--64644). Wabasha Co.: Fassett & Wilson 5620 (Um--216). Winona Co.: Holzinger s.n. [July 1901] (N). Yellow Medicine Co.: Ballou s.n. [July 27, 1924] (Du--140432); J. F. Brenckle 4608 (N). County undetermined: J. E. Campbell s.n. [Girard, July 1897] (Ob--50792); Roman s.n. [29/7/1893] (S). NORTH DAKOTA: Benson Co.: Lunell 546 (Ur), s.n. [June 24th, 1899] (Dt), s.n. [July 15, 1906] (In), s.n. [Butte, August 4, 1907] (Du--75591, N, N), s.n. [August 22, 1909] (In), s.n. [Butte, September 3, 1910] (Ur), s.n. [Butte, August 28, 1911] (W--893168), s.n. [Pleasant Lake, August 5, 1914] (W--893169). Dunn Co.: Heidenreich 248 (Ok). Grant Co.: W. B. Bell 1348 (Ca--587763). McLean Co.: F. P. Metcalf 427 (W--1070875). Pembina Co.: Bergman 2256 (Cm). Richland Co.: H. F. Bergman 2335 (N); O. A. Stevens s.n. [Aug. 4, 1936]

(Gu--21830), s.n. [Kindred, August 20, 1944] (W--1973378. Rolette Co.: Wright 553 (N). Wild Rice Co.: Lee s.n. [Wild Rice, July 27, 1891] (La). SOUTH DAKOTA: Brown Co.: Over 17223 (Um--230); Petrak s.n. [16.VIII.1950] (S). Custer Co.: Barr s.n. [July 25, 1940] (Ba); Yuncker & Welch 4100 (Dp). Deuel Co.: Sanborn s.n. [August 9, 1918] (Du--92151). Fall River Co.: Rydberg 933 (W--210965). Grant Co.: Kienholz s.n. [Big Stone, July 1914] (Ur). Kingsbury Co.: J. J. Thornber s.n. [Iroquois, 8/11/94] (Ca--104810). Lawrence Co.: F. L. Bennett 1093, in part (Vi). Pennington Co.: F. L. Bennett 1093, in part (Bt--58323, Ua--43203). Roberts Co.: Corbett & Williams 232 [Herb. Corbett 345] (We); Over 14384 (W--1242262); T. A. Williams 232 (Du--9551). Spink Co.: J. F. Brenckle 37-48 (Ba, Mi, N, Up), 47-532 (N), s.n. [Mellette, Aug. 1939] (Or--39019); Petrak s.n. [30.VIII.1950] (S); A. E. Ricksecker 73 (Ca--475507, Ob--50809, Po--215260, Um--229, Ur). Todd Co.: Tolstead s.n. [Aug. 1, 1935] (Io--145166). Tripp Co.: T. A. Williams 78 (Du--9552). Washabaugh Co.: Over 7079 (Bl--42326, Se--14935). KANSAS: Atchison Co.: Horr & McGregor s.n. [6/26/46] (Lw). Brown Co.: F. Garner s.n. [summer 1925] (Ka--72012). Chautauqua Co.: A. S. Hitchcock s.n. [Chautauqua Co., Aug. 8, 1896] (Ka). Cherokee Co.: R. L. McGregor 3797 (Lw). Cloud Co.: S. V. Fraser 439 (Ka--78939). Comanche Co.: A. S. Hitchcock s.n. [Comanche Co., Aug. 17, 1896] (Ka). Crawford Co.: Gier 6864 (Je--6864); A. S. Hitchcock s.n. [Cherokee, Aug. 1892] (Ka); N. B. Jacobs 181 (Ka--89741). Decatur Co.: A. S. Hitchcock s.n. [Decatur Co., June 2, 1897] (Ka). Doniphan Co.: Agrelius, Hall, Lovejoy, & Maroney s.n. [8-7-13] (Lw); Clothier & Whitford s.n. [July 31, 1897] (Ka). Douglas Co.: A. S. Hitchcock s.n. [Douglas Co., 8.7.99] (Ka); R. L. McGregor 14570 (Hi--198622, W--2327196); Snow 1956 (Lw). Ellis Co.: E. Runyon 280 (Cm, Ok, Se--69270, St--9250, Vt). Ellsworth Co.: A. S. Hitchcock s.n. [Ellsworth Co., July 1895] (Ka). Finney Co.: Carleton s.n. [Garden City, Oct. 10, '92] (Ka). Franklin Co.: R. L. McGregor 12699 (W--2230403). Harper Co.: A. S. Hitchcock s.n. [Harper Co., Aug. 11, 1896] (Ka). Harvey Co.: R. L. McGregor 3471 (Lw). Jackson Co.: Norton & Clothier s.n. [July 4th, 1895] (Ka). Jefferson Co.: W. H. Horr 4228 (N). Johnson Co.: Pellet s.n. [summer 1890] (Ka). Kingman Co.: A. S. Hitchcock s.n. [Kingman Co., Aug. 23, 1896] (Ka). Lincoln Co.: A. S. Hitchcock s.n. [Lincoln Co., July 1895] (Ka). Linn Co.: Clothier & Whitford s.n. [Aug. 9, 1897] (Ka). Logan Co.: Rydberg & Imler 1080, in part (Lw). Meade Co.: A. S. Hitchcock s.n. [Meade Co., Sept. 1, 1897] (Ka). Miami Co.: Clothier & Whitford s.n. [Aug. 8, 1897] (Ka); Oyster 6516 [Herb. Prager 18625] (Gg--31318, Gg--31319); Rohrer 9 (Ka--95668). Morris Co.: Westgate s.n. [Aug. 4, 1898] (Ka). Neosho Co.: A. S. Hitchcock s.n. [Neosho Co., Aug. 1896] (Ka). Osage Co.: Clothier

& Whitford s.n. [Sept. 2, 1897] (Ka). Osborne Co.: Shear 202 (W—227262). Ottawa Co.: A. S. Hitchcock s.n. [Ottawa Co., July 1895] (Ka). Pottawatomie Co.: Herb. Bot. Club s.n. [St. George, Aug. 1, 1893] (W—244181). Pratt Co.: A. S. Hitchcock s.n. [Pratt Co., Aug. 1896] (Ka). Rawlins Co.: A. S. Hitchcock s.n. [Rawlins Co., June 1897] (Ka). Reno Co.: A. S. Hitchcock s.n. [Reno Co., Aug. 25, 1897] (Ka); R. L. McGregor 3931 (Lw). Republic Co.: J. B. S. Norton s.n. [Republic City, Sept. 23, '95] (Ka). Rice Co.: A. S. Hitchcock s.n. [Rice Co., August 1895] (Ka). Riley Co.: Kimball 5687 (Ka); J. B. S. Norton 390 (Ka, N, W—353117); C. H. Thompson s.n. [Manhattan, Aug. 9, 1892] (Ka). Rooks Co.: E. Bartholomew s. n. [Aug. 3, 1891] (Ka). Saline Co.: Hancin 456 (Ka—76792). Scott Co.: V. L. Harms 1107 (N); R. L. McGregor 2169 (Lw); Rydberg & Imler 1080, in part (Ka--75039, N). Sedgwick Co.: T. L. Andrews s.n. [Whichita] (Io—28227); Clothier & Whitford s.n. [Aug. 24, 1897] (Ka); Herb. Wichita Univ. 29 (Lw). Shawnee Co.: Maus s.n. [Auburn, July 20, 1927] (Ka--72219); E. A. Popenoe s.n. [Topeka, July 20, 1879] (Ka). Sheridan Co.: C. Weber 35 (Ka—78148). Stafford Co.: A. S. Hitchcock s.n. [Stafford Co., Sept. 1, 1897] (Ka). Trego Co.: A. S. Hitchcock s.n. [Trego Co., July 1895] (Ka). Woodson Co.: Clothier & Whitford s.n. [Aug. 29, 1897] (Ka). Wyandotte Co.: K. K. Mackenzie s.n. [Rosedale, July 12, 1896] (Ka, We). MISSOURI: Callaway Co.: Schwab s.n. [July 1924] (Up). Clinton Co.: C. R. Barnes s.n. [Converse, 8/4/77] (Pu). Clark Co.: B. F. Bush 9165 (Po—127528); Steyermark 68897 (S). Greene Co.: P. C. Standley 9732 (W—688649). Jackson Co.: B. F. Bush 12327 (N). Jasper Co.: E. J. Palmer 10568 (Bi, Du—205610, S). Johnson Co.: Steyermark 24528 (Ky, N). Lincoln Co.: J. Davis 94 (Ur). Marion Co.: J. Davis 3578 (Ur), FDL (Ur), XV (Ur), s.n. [Hannibal, 8-7-13] (Au); R. Gmelin s.n. [Hannibal, Aug. 1879] (Io—94992). Platte Co.: Radloff s.n. [July 26, 1956] (Ur). Ralls Co.: J. Davis 4799 (Mi). Saint Louis: Eggert s.n. [4/8/75] (Go), s.n. [St. Louis, Aug. 1875] (Ca—181533, Ca—425203), s.n. [St. Louis, Aug. 8, 1875] (Cm, Po—192593), s.n. [St. Louis, Aug. 1875] (Au, B, Cm, Du—202130, Gg—183215, Io—79816, Mn—6893, Po--97410, Po—192594, Up—60752, W—754953); Engelmann 337 (Pr), s.n. [St. Louis, Sept. 1841] (W); M. Martens s.n. (Br, Br). County undetermined: J. Davis s.n. [Oak Boulder, 9.11.1915] (Au); Lejeune s.n. (Br). LOUISIANA: Orleans Par.: Cocks s.n. [New Orleans, Apr.] (Tl). MONTANA: Cascade Co.: F. W. Anderson 332 (Mn—11928); R. S. Williams 692 (N). Gallatin Co.: Blankinship s.n. [Manhattan, Aug. 16, 1898] (Fc); D. B. Swingle s.n. [Three Forks, July 21, 1933] (Mn—23399, Pl—71562, Se—36665, Ua—15547). Jefferson Co.:

R. Adams s.n. [Fish Creek, Sept. 8, 1871] (W--235941); B. T. Butler 4292 (Du--123486, N). Lewis & Clark Co.: F. D. Kelsey s.n. [July 26, 1892] (Ob--50872), s.n. [Helena, October 17, 1892] (Du-226538, Po--197624). Ravalli Co.: Hitchcock & Muhlick 21937 (N). Sanders Co.: M. E. Jones 8963 (Mn--7890, Po--72923). County undetermined: F. W. Anderson 108 [Great Springs] (Ca--25147). IDAHO: Ada Co.: Christ & Ward 8386 (N); J. A. Clark 253 (Ba, Ca--168207, Du--24186, S, W--543438); Mulford s.n. [Boise, July '92] (C). Canyon Co.: Macbride 304 (Ca--160621, Cm, Du--24185, N, Pl--22566, Ur, W--542255). Kootenai Co.: H. J. Rust 209 (W--870175). Latah Co.: J. H. Christ 6881 (N). Lemhi Co.: J. H. Christ 5962 (N, N). Nez Perce Co.: J. H. Christ 12958 (N); Heald 344 (Pl--104727). WYOMING: Sheridan Co.: A. Nelson 2208 (N), 2258 (W--284732); Tweedy 2664 (N). County undetermined: McCosh s.n. (Pr). UTAH: Box Elder Co.: C. B. Maguire 21402 (Ua--47397); Zundel 252 (Du--75588). Cache Co.: Cronquist 1095 (N, Ua--47396); Gessel s.n. [July 29, 1939] (N, Ua--47394); C. B. Maguire 3731 (Ua--11388), 20098 (N, N, Ua--47395), 21401 (Ua--47398); C. P. Smith 1996 (Du-24184, Ua--11384). Davis Co.: Garrett 7368 (Gg--321166). Salt Lake Co.: M. K. Clemens s.n. [Murray, Sept. 25, 1909] (Gg--37137); M. E. Jones 487 (Po--70992); F. E. Leonard s.n. [Salt Lake City, July 17, 1884] (Io--131122, Ka--81400, Ob--50874); Pammel & Blackwood 3638 (Io--28507, Io--83751); Rydberg s.n. [July 17, 1884] (Du--337390); S. Watson 822 (W). Utah Co.: Abrams 7213 (Du--89892); J. A. Harris C.27628 (H--40515); B. F. Harrison 9217 (Ca--882642, W--1825701), 11865 (W--2098708); M. E. Jones 1487 (Br, Go, Po--70993, Sg--16089, Ua--11383); Tidestrom 1718 (S, W--507241); Woodcox 55 (Au--122283). County undetermined: F. E. Leonard 252 [Jordan Valley] (Ob--50873); E. L. Little s.n. [July 3, 1928] (Ok--10352). NEVADA: Lincoln Co.: M. E. Jones s.n. [Panaca, Sept. 5, 1912] (Po--69600). COLORADO: Adams Co.: Eastwood 41, in part (Ca-450176). Arapahoe Co.: L. Kelso 1441 (Hp). Boulder Co.: H. W. Campbell 121 (Bl--42308); McFarlane s.n. [1881] (Bl--42310); Ramaley 740 (Bl--42320); W. W. Robbins 2554 (Bl--42318), 5731 (Bl--42309); Tweedy 5124 (N). Clear Creek Co.: Bethel s.n. [Clear Creek, Aug. 9, 1916] (Gg--31326); Heustis s.n. [Clear Creek, 7-19-16] (Bl--42317), s.n. [Clear Creek Junction, Aug. 16, 1916] (Bl--42321); M. E. Jones s.n. [Georgetown, 7-24-1878] (Po--83731). Denver Co.: Bethel s.n. [Denver, 7.1906] (Fc); Eastwood 41, in part (Bl--42319, Gg--31325, St--22946, W--582287), s.n. [Denver, Aug. 1890] (Bl--42336); McCosh & Greene s.n. [Denver, Aug. 22] (Ec, Jr, Ml, Pr, Va); H. G. Smith Jr. s.n. [Denver, Aug. 1888] (W), s.n. [Berkeley, Aug. 2, 1901] (Bl--42312); H. S. Wallace s.n. [Denver, July 29, 1933] (Bt--17875). Douglas Co.: R. B. Livingston 457 (H--77453). El Paso Co.: I. M. Johnston 2633 (Ca--206896); R. Sutton 143 (H--77463). Fremont Co.: T. S. Brandegee 464 (Ca--169172). Gilpin Co.: Scovell s.n. [Central City, 1869] (Mi). Jefferson Co.: L. S. Ehlers 688 (Mi); Ewan 14552 (Bl--52992, Gg--345128); M. E. Jones 523 (Br, Du--151783, N, Po--70994, Ua--11382). Larimer Co.: C. F. Baker s.n. [Fort Collins, 8-25] (Po--63901); Collector undesignated 2015 (N, Vt); J. H. Cowen 405 (W--254915), s.n. [July 11, 1893] (N); Crandall 2014 (Fc), s.n. [Fort Collins, Aug. 3, 1898] (Io--22911); Herb. State Agr. Coll. Colo. 2015 (Fc, W--489491); W. F. Marshall 2016 (Fc, Fc, Mn--6886, Pl--22569, W--489492); Osterhout s.n. [July 22, 1901] (N, Po--63893); Preston s.n. [E. of Fort Collins, 7-31-1921] (Fc). Las Animas Co.: C. M. Rogers 4981 (W--2053370). Logan Co.: Osterhout 7740 (Po--216654). Weld Co.: Ewan 12267 (En, Pl--122581); M. T. James s.n. [Roggen, Oct. 3, 1931] (Bl--42314); E. L. Johnston 507a (N), 507b (W--768891); Osterhout s.n. [Aug. 5, 1905] (Du--77582); Ramaley 12393 (Bl--42316), 12890 (Bl--12890). Yuma Co.: Eggleston 15551 (Po--63862); Ramaley 12741 (Bl--42366). County undetermined: Crandall 175 (Fc); W. F. Marshall s.n. [Mason's River Front Farm, July 22, 1899] (N). NEBRASKA: Buffalo Co.: W. E. B. s.n. [Aug. 1922] (Ok--10353). Cass Co.: J. L. Morrison 1200 (Go); T. A. Williams s.n. [Weeping Water] (W--750408). Dawson Co.: Wahl s.n. [Willow Island, Jul. 1922] (Io--102424). Douglas Co.: Enander s.n. [31/8/1921] (S); Kleeberger s.n. [Omaha] (Gg--31333). Hooker Co.: Rydberg 1515 (N, W--210370). Kearney Co.: H. Hapeman s.n. [Minden, Aug. 23, 1939] (Hp, Ky). Knox Co.: F. E. Clements 2719 (Ka, W). Lancaster Co.: J. L. Sheldon s.n. [Lincoln, 7-20-98] (We, We); H. J. Webber s.n. [July 4, '85] (C). Nemaha Co.: J. L. Sheldon s.n. [Peru, July 7, 1900] (We). Otoe Co.: C. J. Elmore s.n. [Talmage, 1890] (Je--5840), s.n. [Talmage, 7/11/1891] (Je--3156, Je--3157). Sheridan Co.: R. E. Buchanan s.n. [Aug. 2--20, 1905] (Io--51233), s.n. [Spade Ranch, 1905] (Io--49012); J. B. Hatcher s.n. [on the Running Water, VIII.1--10.1886] (Ca--25147), s.n. [July 1886] (Pr). Thomas Co.: Blumer s.n. [Halsey, Sept.--Oct. 1902] (Io--82631); Krautter s.n. [July 23, 1907] (Up--45723, Up--45745). Washington Co.: Lallman s.n. [August 19, 1936] (Bt--45447). County undetermined: P. E. Abbott s.n. [1907] (Gg); R. Thomson 158 [Rat Lake] (W--788961), 302 [Crescent Lake] (N, W--789095). OKLAHOMA: Cherokee Co.: C. S. Wallis 669 (St). Craig Co.: Brensing 21 (Ca--882658, St--18268); E. B. Miller 63 (St--25006). Creek Co.: O. M. Clark 3354 (B). Delaware Co.: C. S. Wallis 2534 (St). Ellis Co.: G. W. Stevens 2901 (Du--68056, Ok, Ur), A.2901 (St--9246). Grant Co.: G. W. Stevens 1791 (Du--77110, Ok, Ok--

21305, Po--63860, St--9247, St--9248). Harper Co.: Stratton 400 (St--26127, St--26128). Muskogee Co.: E. L. Little 2435 (Ok--10311); C. S. Wallis 7728 (Au--170667, St); Waterfall 10284 (St), 10298 (St). Oklahoma Co.: M. Hopkins 121 (Ok); Waterfall 2462 (N), 3074 (Ok). Okmulgee Co.: Stemen 547 (Ok). Ottawa Co.: G. W. Stevens 2308 (W--589895). Payne Co.: Van Vleet 399 (Ok--20508). Sequoyah Co.: C. S. Wallis 5557 (St), 7736 (St). County undetermined: G. W. Stevens 2148 (Ok). TEXAS: Hartley Co.: Cory 16431 (Md); Parks & Cory 16428 (Tr), 16429 (Tr), 16430 (Tr). Hemphill Co.: E. L. Reed 4034 (Au, Au, W--1697865); Tharp 4503 (Um--231), 4504 (Au). Oldham Co.: Ferris & Duncan 3513 (Du--125420, Gg--31330, N); York & Rodgers 363 (Au--201798). NEW MEXICO: Socorro Co.: Wooton s.n. [Crain's Ranch, July 14, 1900] (In, N, Ob--50875). County undetermined: C. Wright 1497 (T), 1498 [Valley of the Mimbres, 1851] (T), 1499 (Ca--248343). ARIZONA: Coconino Co.: D. T. MacDougal 566 (Au, N). Pima Co.: W. W. Jones s.n. [Marshall, July 14, 1922] (Ca--407929). Yavapai Co.: Toumey s.n. [Aug. 5, 1891] (Du--90895), s.n. [Camp Verde, Aug. 1891] (Tu--32401). County undetermined: Edw. Palmer s.n. [Arizona, 1869] (W). WASHINGTON: Benton Co.: Gotfredson 90 (Po--163640). Clark Co.: C. English Jr. 477 (W--1620266); Gorman 5069 (Du--189721, Or--22421). Douglas Co.: Cotton 1396 (Pl--22583). Kittitas Co.: C. V. Piper s.n. [Ellensburg, July 9, 1897] (Pl--22630). Klickitat Co.: Suksdorf 5862 (Pl--138418), 7972 (Pl--138419), 12072 (Pl--138420), s.n. [Nov. 1894] (Pl--138424), s.n. [July 8, 1895] (Pl--138425), s.n. [VII. 1904] (N). Lincoln Co.: Suksdorf 1450 (Pl--138422). Okanogan Co.: Dillon 842 (Ca--739564, Pl--151100, Se--94450); Fiker 332 (Pl--76194). Skamania Co.: Suksdorf 6658 (Pl--138417). Stevens Co.: Beattie & Chapman 2188 (Ca--882661, Pl--22574, Um--224, Um--233, W--1871410); Kreager 464 (Ca--882660), 469 (N, Pl--22577, Se--68697, Um--225, W--441235). Whitman Co.: C. V. Piper s.n. [Almota, Aug. 26, 1894] (Pl--22624). Yakima Co.: T. S. Brandegee s.n. [Ahtannam Creek, 1882] (Ca--169646); Cotton 787, in part (Pl--22582); L. F. Henderson s.n. [June 19, '92] (Se--14943); C. V. Piper s.n. [Aug. 6, 1894] (Pl--22625); Watt s.n. [North Yakima, Aug. 1895] (Pl--22626). County undetermined: Lake & Hull 605 [Rock Lake] (Pl--22628). OREGON: Clackamas Co.: Suksdorf s.n. [Aug. 2, 1896] (Pl--138421). Columbia Co.: L. F. Henderson s.n. [Columbia R., August 12, 1885] (Du--90899). Linn Co.: F. E. Lloyd s.n. [11 July 1894] (N). Marion Co.: J. C. Nelson 4005 (Al). Multnomah Co.: Gilkie s.n. [Portland, July 31, 1935] (Or--33494, We); E. P. Sheldon 11167 (Du--96562, Du--104990, N, Pl--22573), S.11167 (Po--70995). Umatilla Co.: Benson 2461 (Po--267666); M. E. Peck 10461 (Du--166843, Du--178070). Wasco Co.: L. F. Henderson 795 (Or--8864). Sauvin's Island: J. T. Howell s.n. [Sauvin's Island, July 1880] (Or--8865).

CALIFORNIA: Contra Costa Co.: Condit 253 (Ca--454110); V. Jones s.n. [Orwood, Aug. 29, 1920] (Gg--31320); Nobs & Smith 942 (Ca--192064). Mendocino Co.: Chesnut 584 (W--430636). Sacramento Co.: Jepson s.n. [Lower Sacramento, Sept. 1891] (C); Wilkes s.n. [marshes on the Lower Sacramento] (W). San Joaquin Co.: Crampton 3149 (Gg); Jepson 5693 (Ca), 10215 (Ca); E. E. Stanford 721 (Du--170466, Po--147778). Shasta Co.: M. S. Baker s.n. [Fall River Lake, July 15, 1899] (Ca--450175). Solano Co.: Jepson s.n. [16 Sept. 1891] (Up--17105); H. L. Mason 12666 (Ca--192063, Du--415507, Gg--417883). Yuba Co.: Eastwood s.n. [Marysville, Sept. 1919] (Gg--31322). Grand Island: Jepson 21229 (Ca, Ca), s.n. [17 Sept. 1891] (Ca--25149). JAMAICA: Pessin s.n. (Tl). GREAT BRITAIN: England: R. Campbell s.n. [Bristpool] (Mm--20478). SWEDEN: Blom s.n. [2/9 /1939] (Go); Schontz s.n. (Go). GERMANY: Kausch s.n. [Rostock, 1869] (La). CULTIVATED: Austria: Herb. Mus. Bot. Stockholm s.n. [Hort. Schönbr.] (S). Belgium: Herb. Jard. Bot. Brux. s.n. (Br, Br); M. Martens s.n. [h. b. L.] (Br), s.n. [seed from St. Louis, Mo.] (Br). England: J. D. Hooker s.n. (Br); Linnaeus s.n. [Hort. Cliff. G.834, S.5; Bailey Hort. neg. 6406] (N--photo). France: Herb. W. H. Harvey s.n. [Jard. Bot. de Dijon, 1840] (Du--166437), s.n. [h. f. 1844] (Du--166436); Herb. Hort. Paris. s.n. [Aug. 1820] (W--617239), s.n. [Jul. 1822] (W--617239). Germany: Herb. Hort. Gast. s.n. [1806--12] (W--617453); Herb. Martius s.n. (Br); Herb. Mus. Bot. Berol. s.n. [Sept. 1842] (Br); Herb. Prager 18639 (Gg--31457); Schulz & Schulz s.n. [Berlin, 11.8.1897] (B). Maryland: McCann s.n. [9-15-36; seed from Copenhagen] (Md), s.n. [9-15-36; seed from Gradiva Botanica, Bucharest] (Md), s.n. [9-15-36; seed from Helsingfors] (Md). Netherlands: Burmeister s.n. (S). New York: G. V. Nash s.n. [N. Y. Bot. Gard. Cult. Pl. 20853] (N), s.n. [N. Y. Bot. Gard. Cult. Pl. 20972] (N); R. C. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. 20972; Aug. 21, 1905] (N), s.n. [N. Y. Bot. Gard. Cult. Pl. 20972; June 26, 1906] (N). Spain: Collector undesignated 27 (Q). Sweden: Nietzel s.n. (F--photo, N-photo, S, Sg--photo, Z--photo). Switzerland: Herb. Hort. Bot. Genev. s.n. [27 Juli 1826] (W--264601). LOCALITY OF COLLECTION UNDETERMINED: B. J. Bayer s.n. (Bj); Carson s.n. [North America] (Bz--23754); Collector undesignated 29 (Q), s.n. (Nm, Sg--16106); Engelmann s.n. [America bor.] (Br); Fabius 409 [Granby] (N); H. R. Foster 402 (Se--14941); J. Fowler s.n. (Ms); Herb. Coll. Pharmacy s.n. (Pa, Pa); Herb. W. H. Harvey s.n. (Du--166439); Herb. Linnaeus G.35, S.12 (Ls--type, N--photo of type, Z--photo of type), s.n. (F--photo of isotype, N--photo of isotype, S--isotype, Sg--photo of isotype, Z--photo of isotype); Herb. Meisner s.n. (M); Herb. Mus. Bot. Stockholm s.n. (S, S); Herb. Saldanha 2765

[Herb. Mus. Nac. Rio Jan. ref. VI] (Ja); *Herb. Swartz s.n.* (S, S); *Herb. Torrey s.n.* [N. W. coast] (T); *F. W. Johnson 770c* [Fitches Bridge] (N); *L. A. Koehler s.n.* [U. S.] (Pa); *M. Martens s.n.* (Br); *Née 61* (Q); *New York Bot. Gard. Econom. Mus. 5749* (N); *Parry, Bigelow, Wright, & Schott s.n.* [near the copper mines] (W); *Pollart de Canidri s.n.* (Br); *Schweinitz s.n.* (T); *Short s.n.* (C, S); *J. Torrey s.n.* (Br); *Whipple s.n.* [13-1] (Ob—50805). MOUNTED ILLUSTRATIONS: E. J. Alexander, Addisonia 13: pl. 422. 1928 (N); Am. Mus. Nat. Hist. color slide 27621 [neg. 238840] (Z); Hotchkiss distribution map (Ws); Rydb., Fl. Prairies & Plains fig. 479. 1932 (N); Natl. Geogr. Mag. pl. 3, 7/22 (N); unpubl. watercolor (N); unpubl. pencil drawing (N); Wild Fls. Canada pl. 9 (N).

VERBENA HASTATA f. ALBIFLORA Moldenke, Am. Midl. Nat. 24: 752. 1940.

Synonymy: *Verbena; americana; altissima; urticae foliis angustioribus; floribus albis* Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 187. 1720. *Verbena hastata* var. *alba* Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2211. 1951.

Bibliography: Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 187. 1720; Cheney, Rhodora 4: 246. 1902; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 689. 1908; W. A. Weber, Summer Fl. Northrop Camp mss. 1940; Moldenke, Am. Midl. Nat. 24: 752. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 2 & 101. 1942; Moldenke, Torreya 45: 50. 1945; Moldenke, Phytologia 2: 478. 1948; Moldenke, Alph. List Cit. 2: 507 & 538 (1948) and 4: 1112. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 3, 4, & 198. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2211. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 129 (1952) and print. 2, 3: 129. 1958; Moldenke, Résumé 6 & 472. 1959; Moldenke, Résumé Suppl. 3: 5 & 38 (1962), 4: 13 (1962), 5: 3 (1962), and 6: 1. 1963.

This form differs from the typical form of the species in having white or whitish corollas.

The type of the form was collected by Ellsworth Jerome Hill (*no. 9.1888*) in wet ground at Attica, Wyoming County, New York, on August 8, 1888, and is deposited in the herbarium of the University of Illinois at Urbana. The form is known thus far only from Massachusetts, New York, New Jersey, Iowa, and Wisconsin, and has been found in pastures, along roadsides, and at the edges of ponds, flowering in August. Cors comments about his collection cited below: "Possibly *V. hastata* x *urticifolia*, as plants of both species were growing within a few feet of this plant." However, I see no evidence of hybridity in his specimen -- the collection seems typical of the albino form of *V. hastata* L. The Lawrence & Dress collection cited below was distributed originally as *V. urticifolia* L.

In *all*, 9 herbarium specimens, including the type, and 3 mounted photographs and clippings have been examined by me.

Citations: MASSACHUSETTS: Berkshire Co.: *Moldenke & Moldenke 11741* (N); *W. A. Weber 1590* (Bl--48180). Worcester Co.: *G. E. Stone s.n.* [Proctor's Pond, about 1890] (Ms). NEW YORK: Wyoming Co.: *E. J. Hill 9.1888* (N--photo of type, Ur--type, Z--photo of type). NEW JERSEY: Ocean Co.: *Lawrence & Dress 570* (Bm). IOWA: Des Moines Co.: *Davidson & Werlein 979* (W--2261038). WISCONSIN: Green Lake Co.: *Cors s.n.* [August 30, 1951] (Ws). Milwaukee Co.: *Shinners s.n.* [Aug. 31, 1938] (Ws). Outagamie Co.: *J. H. Schuette s.n.* [Kaukauna, Aug. 7, 1889] (W--752023). MOUNTED CLIPPINGS: Am. Midl. Nat. 24: 752. 1940 (W).

VERBENA HASTATA f. ROSEA Cheney, Rhodora 4: 245--246. 1902.

Synonymy: *Verbena hastata* var. *paniculata* f. *rosea* Farwell, Papers Mich. Acad. Sci. 2: 37. 1923. *Verbena hastata* f. *rosea* Farwell ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940.

Bibliography: Cheney, Rhodora 4: 245--246. 1902; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 689. 1908; Farwell, Papers Mich. Acad. Sci. 2: 37. 1923; Moldenke, Prelim. Alph. List Invalid Names 46. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 2, 3, 6, & 101. 1942; Moldenke, Alph. List Invalid Names 47. 1942; Moldenke, Am. Journ. Bot. 32: 609. 1945; Moldenke, Alph. List Cit. 1: 41, 208, & 244.(1946), 2: 506, 568, & 581 (1948), and 3: 740, 803, & 948. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 4, 5, 12, 15, & 198. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Fern. in A. Gray, Man. Bot., ed. 8, 1210. 1950; Moldenke, Phytologia 4: 67. 1952; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 129 (1952) and print. 2, 3: 129. 1958; Moldenke, Am. Midl. Nat. 59: 347. 1958; Moldenke, Résumé 6, 7, 16, 19, 366, & 472. 1959; Moldenke, Résumé Suppl. 3: 1, 2, 4, & 5 (1962) and 5: 1 & 3. 1962.

This form differs from the typical form of the species in having the corollas pink, bright-pink, bright-rose, or rose-pink, varying to rose-purple, deep-purple, lavender, or magenta.

The type of the form was collected by Clara Imogene Cheney in mud on the margin of a lily pond in closest proximity to typical *V. hastata* L. at Centreville, Barnstable County, Massachusetts. The collector says "After a most careful examination and comparison of the two forms, no difference was detected excepting in color. The inflorescence, manner of growth, form and texture of the leaves were all alike. I counted sixteen plants of the roseate-flowered form growing in a small space."

The form has been collected in low ground along with the typical form and in wet ditches, at altitudes up to 400 meters, flowering from July to September, in fruit in July and August. A common name recorded for it is "pink-flowered verbena". In all, 23 herbarium specimens have been examined by me.

Citations: CONNECTICUT: New London Co.: Jansson s.n. [Aug. 9, 1935] (Bl—42325). NEW YORK: Madison Co.: H. D. House 23127 (N, Up, W--1653793). Oneida Co.: H. D. House 26197 (Al); C. H. Peck s.n. [Trenton Falls, Aug. 18, '02] (Al). Queens Co.: E. P. Bicknell 7353b (Al, N), 7353c (N). Tompkins Co.: S. J. Smith 1464 (Al, It). NEW JERSEY: Monmouth Co.: O. E. Pearce s.n. [Swartzwood, Aug. 1, '84] (W—147578). PENNSYLVANIA: Huntingdon Co.: E. H. Graham s.n. [7/12/32] (Cm). Sullivan Co.: F. R. Fosberg 15770 (Up). WEST VIRGINIA: Preston Co.: J. L. Sheldon 1881 (We). ILLINOIS: Champaign Co.: Ahles 2918 (Ur). DuPage Co.: W. S. Moffatt 573 (Ur), 574 (Ur). MICHIGAN: Monroe Co.: M. McDonald 5650 (Mi). WISCONSIN: Buffalo Co.: Fassett & Hotchkiss 3322 (N, Ws). Polk Co.: R. W. Pohl 515 (Ws). KANSAS: Franklin Co.: R. L. McGregor 12700 (W--2230404).

VERBENA HASTATA var. **SCABRA** Moldenke, Résumé Suppl. 3: 6 & 8, nom. nud. 1962, var. nov.

Haec varietas a forma typica speciei foliis rigidioribus supra scabris subtus plusminus breviter pubescentibus differt.

This variety differs from the typical form of the species in having its leaf-blades more rigid, conspicuously scabrous above, and often more or less conspicuously pubescent beneath.

The type of the variety was collected by Herbert Louis Mason (no. 13502) on Highway 81 north of the Modoc-Lassen County line on August 11, 1947, and is deposited in the herbarium of the University of California at Berkeley.

Collectors describe the plant as "very tall", the unbranched stems 2--4 feet tall, erect, several from a woody crown, and the flowers blue. It has been found in moist ditches and wet places, swampy fields, on dykes, and along highways, blooming from June to September, fruiting from July to October, from 300 to 4300 feet altitude. It is called "blue vervain". Elmer describes it as "very rank along irrigation ditches", while Cory says of it "abundant in moist flood plain of river". Galway calls it a "weed in wet meadow associated with Helenium montanum, Carex, and Scirpus". J. M. Johnson refers to it as an "erect clumped herb scattered in canyon bottom near stream bank, associated with Carex, Juncus, Bidens, and Hordeum in moist coarse loam soil." J. A. Harris C.28865 was used in a study of osmotic pressure. Kreager 475 is a mixture with V. stricta Vent.

It is very probable that some of the northwestern specimens cited by me on previous pages under typical V. hastata belong to var. scabra, since they were examined by me and returned to their respective owners in some cases many years before I became convinced of the validity of this taxon. They need re-examination.

Thus far, 48 herbarium specimens, including the type, have been examined and so annotated by me.

Citations: BRITISH COLUMBIA: Yale Co.: Calder & Savile 10711

(W--2310063). County undetermined: J. Macoun s.n. [Sicamous, Aug. 14th 1889] (W--219611). NORTH DAKOTA: Richland Co.: O. A. Stevens s.n. [Aug. 4, 1936] (Hi--192046). MONTANA: Gallatin Co.: Blankinship s.n. [Logan, July 23, 1906] (W--541111). IDAHO: Latah Co.: L. F. Henderson s.n. [Juliaetta, Aug. 31, '94] (W--226469). Owyhee Co.: J. M. Johnson 254 (Hi--192662, N). UTAH: Utah Co.: Galway 2192 (Ca--914080); A. O. Garrett 3149 (Ca--445569), 7868 (Ca--882659); J. A. Harris C.28865 (Ca--882655). TEXAS: Hemphill Co.: Cory 50298 (Ca--754878, Du--345342, N, Sm, W--1885944). NEW MEXICO: Socorro Co.: Wooton s.n. [Crain's Ranch, July 14, 1900] (W--562248, W--736876). WASHINGTON: Okanogan Co.: Elmer 537 (N, Pl--22629, Po--63903, Vt, W--352309). Skamania Co.: Suksdorf 10572 (Ca--755098, N, N, Pl--139857, S). Stevens Co.: Boner & Weldert 202 (Ca--707946, Du--301168, Gg--310858, N, Pl--93879, Se--85728, Ua--38104); Kreager 475, in part (W--441291). Walla Walla Co.: R. M. Horner 17 (W--281414). Yakima Co.: Cotton 787, in part (W--525258), 1396 (W--525486); Kruckeberg 2545 (Ca--930976, N). OREGON: Multnomah Co.: E. P. Sheldon S.11167 (W--434857). Umatilla Co.: Leiberg 2630 (N, W--275970). CALIFORNIA: Modoc Co.: H. L. Mason 13502 (Ca--192061--type). San Joaquin Co.: H. L. Mason 5425 (Ca--635119). Shasta Co.: Nobs & Smith 1040 (Ca--192062, Du--415615, N). County undetermined: J. S. Newberry s.n. [Upper cañon of Reb River, Aug. 8] (W).

VERBENA HATSCHBACHI Moldenke, Lloydia 13: 226. 1950.

Synonymy: Verbena hastchbachii Moldenke ex Angely, Fl. Paran. 12: 17, sphalm. 1958. Verbena hatschbachii Moldenke, Résumé 428, in syn. 1959.

Bibliography: Moldenke, Lloydia 13: 226. 1950; Moldenke, Phytologia 3: 377. 1950; Stellfeld, Trib. Farmac. [Vellozoa] 19 (10): 167. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Angely, Fl. Paran. 7: 6, 7, & 12 (1957) and 12: 17. 1958; Moldenke, Résumé 110, 428, & 472. 1959; Moldenke, Résumé Suppl. 1: 23. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Small decumbent herb; stems very slender, tetragonal, puberulent, rooting at the nodes; branches ascending, very slender, rather acutely tetragonal like the stems, puberulent with more or less upwardly curved hairs; nodes annulate; principal internodes 1--4.5 cm. long; leaves decussate-opposite; petioles slender, 3--5 mm. long, sparsely strigillose, margined; leaf-blades membranous, bright-green on both surfaces, ovate in outline, 6--16 mm. long, 6--20 mm. wide, pinnatifid into 3 or 5 lobes, each lobe often again 2- or 3-lobulate, the lobules often with 1 or 2 small teeth near their acute apex, sparsely strigillose on both surfaces; midrib and the 2 or 4 secondaries filiform, often obscure on both surfaces or subimpressed above and slightly prominulous beneath; veinlet reticulation indiscernible on both surfaces; inflorescence terminal, spicate, abbreviated, the floriferous portion subcapitate when young, elongating to 2 cm. in fruit; peduncles very slender or subfiliform, 1--4.5 cm. long, acutely tetragonal, whitish-puberulent with somewhat antrorsely curved occasionally gland-tipped hairs; bractlets lanceolate, about 5 mm. long and 1 mm. wide, attenuate-acute at the apex, often purplish, white-ciliate along the margins, otherwise glabrate; calyx 4--5 mm. long, purplish, 5-ribbed, white-ciliate on the ribs, otherwise glabrous, its rim unequally 5-apiculate; corolla hypocrateriform, violet or blue, the tube barely equaling the calyx, the limb about 3 mm. wide, densely puberulent on the outside.

The type of this species was collected by Gert Hatschbach (no. 1621) -- in whose honor it is named -- along the road from Rio Taquari to Rio Divisa, in the municipality of Piraquara, Paraná, Brazil, on November 13, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species has been collected at altitudes of 1000 to 1300 meters, blooming in July and November. In all, 5 herbarium specimens, including the type, have been examined by me.

Citations: BRAZIL: Paraná: Hatschbach 1621 (N--type), 4895 (Sm). Santa Catarina: Smith & Klein 7376 (N, W--2251273, Z).

VERBENA HAYEKII Moldenke, Phytologia 2: 148. 1946.

Synonymy: Verbena procumbens Hayek in Engl., Bot. Jahrb. 42: 163. 1908 [not V. procumbens Forsk., 1775].

Bibliography: Forsk., Fl. Aegypt.-arab. 10. 1775; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Hayek in Engl., Bot. Jahrb. 42: 163. 1908; Prain, Ind. Kew. Suppl. 4: 245. 1913; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35 & 102. 1942; Moldenke, Phytologia 2: 148. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 26. 1947; Moldenke, Castanea 13: 116. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 43, 44, & 63. 1948; Moldenke, Alph. List Cit. 2: 531 & 602 (1948), 3: 688 & 957 (1949), and 4: 1054, 1112, & 1229. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73 & 198. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Phytologia 5: 24. 1954; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 85, 372, & 472. 1959.

Prostrate creeping perennial herb; branches elongate, prostrate, rooting, glabrous; branchlets erect, short, twiggy, sparsely setose; leaves cuneate-oblong or obovate, narrowed at the base, sessile, coarsely incised-dentate, strigose-hirtous on both surfaces; spikes subfastigiate, often becoming cylindric at the base of the branches; bractlets ovate-lanceolate, acute at the apex, setose, subequaling the calyx; calyx angulate, about 3 mm. long, the rim 5-dentate; corolla varying from purple, lilac, pink, purplish-blue, or pale hortense violet to blue-purple, blue, or violet, sometimes white or "white and hairy in the center, the lobes lilac or pink", 6--7 mm. long; upper anthers not appendaged.

The type of this species was collected by August Weberbauer (no. 2573) along roadsides at La Oroya, at an altitude of 3700 to 3800 meters, Junín, Peru, and was deposited in the herbarium of the

Botanisches Museum at Berlin, where it was photographed by Macbride, but is now destroyed.

This high alpine species has been found on turf hillsides, in meadows, along roadsides associated with Ranunculus and grasses, on grassy-shrubby steppes, in cultivated soil, and in thin soil over limestone, at altitudes of 3250 to 5660 meters, flowering in January. Stork & Horton call it "a lowly pasture herb, possibly introduced among grass" and describe the flowers as "white and hairy in the center, the lobes lilac or pink". Ochoa 268 is said to have had white flowers

The species has been collected in anthesis from November to January and in March and April, in fruit in January, and has been misidentified and distributed in herbaria under the names V. cuneifolia Ruíz & Pav. and V. hispida Ruíz & Pav. A common name reported for it is "canserccora". Forskål's V. procumbens is a synonym of V. supina L.

Weberbauer comments as follows about our plant: "Steht entschieden der vorigen Art [V. weberbaueri] nahe, ist aber durch die verlängerten, wurzelnden Äste, die grösseren Blüten, der anders gestaltete Inflorescenz und andere Blätter verschieden."

In all, 24 herbarium specimens and 3 mounted photographs, including phototypes, have been examined by me.

Citations: PERU: Cuzco: F. L. Herrera 1409 (W--1283221). Huancavelica: Stork & Horton 10820 (Ca--655765); Tovar 115 (W--2100409, Z), 855 (Ss). Junín: W. H. Hodge 6237 (Ms, N); A. S. Kalenborn 36 (Du--103350, N, W--1044284), 176 (Du--103355); Kalenborn & Kalenborn 36 (N); Kunkel 375 (Gg), 385 (Gg), 814 (Mi), 817 (Mi); Ochoa 268 (W--1950563); Weberbauer 2573 [Macbride photos 17442] (Kr--photo of type, N--photo of type, N--photo of type). Puno: P. Aguilar F. s.n. [Febr. 2, 1948] (Z); F. W. Pennell 13409 (N); Soukup 259 (Ca--619311, W--1775352); D. Stafford 427 (K). Department undetermined: Cook & Gilbert 99 [Sicuani, Vilcarnota Valley] (W--603386); C. Watkins s.n. [Tuapata, 1916] (W--1059586).

VERBENA HERTERI Moldenke ex Herter, Revist. Sudam. Bot. 4: 186, nom. nud. 1937; Moldenke, Revist. Sudam. Bot. 5: 42--43. 1937.

Synonymy: Verbena dumetorum Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947.

Bibliography: Herter, Revist. Sudam. Bot. 4: 186. 1937; Moldenke, Revist. Sudam. Bot. 5: 42--43. 1937; Moldenke, Lilloa 6: 331. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 101. 1942; Moldenke, Lilloa 10: 384. 1944; Augusto, Fl. Rio Grande do Sul 213 & 233. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 64. 1948; Moldenke, Alph. List Cit. 2: 357, 358, & 532 (1948) and 3: 780 & 875. 1949;

Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 100 & 198. 1949; Moldenke, Phytologia 3: 377. 1950; Moldenke, Résumé 110, 119, 363, & 473. 1959.

Low herb, 15--60 cm. tall; stems and branches prostrate, creeping, tetragonal, very slender, varying from lightly puberulent to glabrate or glabrous; internodes abbreviated; leaves small; petioles elongate, 4--10 mm. long, glabrate, slightly margined above; leaf-blades thin-membranous, oblong or elliptic to ovate, 8--14 mm. long, 4--10 mm. wide, obtuse or very obtuse at the apex, long-acuminate or cuneate at the base and protracted into the petiole, coarsely crenate or rather irregularly serrate along the margins from the widest part to the apex with 1--5 appressed bluntish teeth per side, occasionally oblong with more or less parallel entire margins and 3-toothed only at the apex, entire from the widest part to the base, glabrous or glabrate on both surfaces; peduncles elongate, slender, 4.7--7 cm. long, erect, tetragonal, obscurely and minutely puberulent or glabrate; inflorescence spicate; spikes terminal, erect, solitary, abbreviated, about 2--12-flowered; bractlets lanceolate, 4--5 mm. long, long-acuminate at the apex, long-ciliate along the margins, otherwise glabrous, shorter than the calyx; flowers fragrant; calyx tubular, about 6 mm. long, 5-costate, membranous between the ribs, sparsely pilose with ascending white hairs, its rim slightly zygomorphic, 5-apiculate; corolla hypocrateriform, varying from lilac-purple, pink-purple, purple-lilac, or deep red-lilac to red-violet, violet, or deep-red, long-exserted, its tube cylindric, about 11 mm. long, the limb irregularly 5-lobed, about 9 mm. wide, the lobes about 4 mm. long, each shallowly notched at the apex; stamens 4, didynamous, the upper pair each with a long clavate glandular appendage; pistil included, about 9 mm. long, shortly bifid at the apex.

The type of this distinctive species was collected by my good friend and colleague, Wilhelm Gustav Herter (*no. 979*; Herb. Herter 82378] in sandy banks, at an altitude of 50 meters, Artigas, Uruguay, in November, 1927, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species differs from all other known Uruguayan species of the section *Glandularia* in its non-pinnatifid and non-incised leaf-blades. It has been found in fields and grassy fields, among bushes on river shores, on sandy banks, in arroyos, and in rather shady sandy riparian soil, at altitudes of 40 to 60 meters, flowering in October, November, and January. The type of *V. dumetorum* was collected by Cornelius Osten (*no. 3326*) among bushes on the shores of Río Arapey, department of Salto, Uruguay, on October 15, 1896, and is deposited in the herbarium of the Museo de Historia Natural at Montevideo. Osten's original description on the type sheet is "*Glandularia*, affinis videtur V. erinoidi Lam. sed differt glabritie et foliorum structura. Caulibus repentibus, prostratis, tetragonis, cum foliis glaberrimis, foliis ovatis, obtusissimis, grosse crenatis, basi cuneata longe petiolatis, apicis longe pedunculatis, terminalibus, erectis paucifloris, flor. pulchre violaceis; appendicibus antherarum clavatis; corolla longe exserta."

In all, 13 herbarium specimens, including the types of both names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: *Rambo 26125* (Rb). URUGUAY: *Berro 2996* (N); *Herter 979* [Herb. Herter 82378] (B--isotype, B--isotype, Ca--323326--isotype, It--isotype, N--type, S--isotype, Ut--92057--isotype), *979a* [Herb. Herter 50886] (B); *Osten 3128* (Ug), *3326* (Ug); *Rosengurtt B.3770* (N).

VERBENA HIRTA Spreng. in L., Syst. Veg., ed. 16, 2: 749. 1825 [not *V. hirta* Grah., 1959].

Synonymy: *Verbena pohliana* Mart. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947.

Bibliography: Spreng. in L., Syst. Veg., ed. 16, 2: 749. 1825; Cham., Linnaea 7: 255--256. 1832; Walp., Repert. Bot. Syst. 4: 22-23. 1845; Schau. in A. DC., Prodr. 11: 540. 1847; Schau. in Mart., Fl. Bras. 9: 185. 1851; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Dusén, Arch. Mus. Nac. Rio Jan. 13: 36. 1903; Hayek, Denkschr. Kaiser. Akad. Wissen. Math.-nat. 79 (1): 294. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 44, 74, & 101. 1942; Moldenke, Alph. List Cit. 1: 21, 22, 56, 172, 244, 265, 289, & 290. 1946; Augusto, Fl. Rio Grande do Sul 210 & 232. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 26. 1947; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 2: 362--364, 366--370, 402, 444, 445, 449, 486, 532, 534, 551--553, & 624 (1948), 3: 670, 675, 687, 750, 772, 814, 815, 846, 848, 855, 870, 900, & 969 (1949), and 4: 1015, 1077, 1081, 1113, 1124, 1180, 1203, 1204, 1248--1251, 1287, 1300, & 1301. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 106, 163, & 198. 1949; Moldenke, Phytologia 3: 74. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208 & 2211. 1951; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Moldenke, Phytologia 4: 188. 1953; Moldenke, Inform. Mold. Set 48 Spec. [4] (1954) and 49 Spec. 3. 1954; Rambo, Sellowia 7: 260. 1956; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 110, 127, 223, 366, 372, & 472. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Low perennial herb, sometimes shrubby, usually to 20 cm. tall, sometimes to 1 m. tall, densely hirsute, villous or villous-lanate to lanate throughout, green or canescent; stems mostly herbaceous, procumbent or erect, fastigiate-branched above, subterete, the angles obsolete; branches ascending, subterete, villous; leaves decussate-opposite or often ternate, subsessile or sessile, ovate or obovate, variable in size, 1.3--4 cm. long, rounded at the apex, cuneate and entire at the base, coarsely serrate or few-toothed and almost 3-lobed, subrugose and substrigose-hirsute or subvelutinous above, densely hirsute (especially on the prominent venation) beneath; venation impressed above, prominent beneath; spikes at first globose, soon becoming cylindric, always dense-flowered, cymose, axillary and terminal, capitate-congested or long-pedunculate and racemose, ternate; bractlets lanceolate, acute at the apex, ciliate-margined, equaling or slightly shorter than the calyx; calyx membranous, about 4 mm. long, plicate-costate, subglabrate between the angles, hirtous on the herbaceous angles which terminate in subulate subequal teeth; corolla small, varying from blue, blue-violet, or violet to lilac, rose, clear-rose, reddish, red, clear-red, or purple, slightly surpassing the calyx, pubescent or lanuginous above on the outer surface, villosulous at the insertion of the stamens within, the mouth bearded with short and uniform submoniliform hairs, the limb about 4 mm. wide, the lobes retuse at the apex; filaments distinct, the upper ones longer and cernuous; anthers muticous; cocci linear, fuscous and 5-striate on the back, areolate, the commissural face broadly white-granulate.

Walpers (1845) places this species in his Section *Verbenaca*, Subsection *Inermes*, Group *Foliosae*, Subgroup *Micranthae*, and Secondary Subgroup *Holophyllae*. It has been collected on campos, dry or sandy campos, rocky campos, burned-over campos, pasture lands, fields, littoral regions, waste places, and open places at the edge of marshes, at altitudes of 500 to 2300 meters, in anthesis from August to March and in June, and in fruit in March, April, June, and November. A common name is "campo verbena". It has been in cultivation since 1825. Herbarium specimens have been misidentified and distributed under the names *V. marrubioides* Cham., *V. strigosa* Cham., and *Lantana sellowiana* Link & Otto. On the other hand, the *Dusén 6798* distributed as *V. hirta* is actually var. *gracilis* Dusén. The so-called *V. hirta* of Graham is actually *Lantana hirta* Grah.

The type of *V. pohliana* was collected by Johann Emanuel Pohl — in whose honor it was named — in 1839 somewhere in Brazil, probably at Registo Velho or Queluz in São Paulo.

The *Dusén 8*, cited below, has very large leaves, while *Bailey & Bailey 824*, according to L. H. Bailey, has its anthers unappendaged. The *Rombouts s.n.*, cited below, exhibits one dark-green very hairy stem and one light-green lightly hairy stem, while *Hauff 16-35* shows one extremely hairy sterile stem and one less hairy floriferous stem. The *Otto s.n.* cited from cultivation in Germany was taken from plants grown from seed sent by Sellow from Brazil; the specimen was deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride, but is now destroyed. It may have been the actual type of the species. *Smith & Reitz 8916* is a mixture with *V. lobata* var. *sessilis* Moldenke.

Schauer (1847, 1851) cites *Sellow s.n.* [Mogy], *Pohl s.n.* [Registo Velho et Queluz], *Riedel s.n.* [Castro], and *Lund s.n.* [Castro] from São Paulo. Hayek (1908) cites *Wacket s.n.* [inter Pilar et Alto da Serra], *s.n.* [prope S. Bernardo], and *s.n.* [prope Campo Grande], and *Campos Novaes s.n.* [Campinas], also all from

São Paulo, Brazil.

In all, 210 herbarium specimens and 3 mounted photographs have been examined by me.

Citations: BRAZIL: Minas Gerais: Aragão 23 [A. Lutz 2287] (Lz); Brade 15664 [Herb. Rio Jan. 32898] (B); Burret & Brade 16042 [Herb. Rio Jan. 35233] (N); P. Clausen 246 [1842—43] (Br), s.n. [Aug.—April 1840] (Br); Collector undesignated s.n. (Ja—32328, Ja); Dusén 2036 (S); Henschen II.209 (W--209642); F. C. Hoehne s. n. [Pocos de Caldas, Jan. 9, 1919] (Sp--2685); Mendes Magalhães 531 [Herb. Jard. Bot. Belo Horiz. 34357] (N); Mosén 966 (N, S), 967 (S); Occhioni s.n. [Herb. Rio Jan. 16458] (N); Regnell 1335 [Caldas, Jan. 1866] (Ja--14849), II.209 [Capivary, 1862—63] (S), II.209 [Caldas, 7/1/1868] (S), II.209 [Caldas, 1874] (N, S); Widgren 1212 [1845] (Br), 1213 [1845] (Br), s.n. [1845; Herb. Rio Jan. 14843] (Lu, Lu, N, S, S, W--1199650, W--1323095), s.n. [Brasilia] (S). Paraná: Braga & Lange 221 (Bm, W--2369347), 329 (W--2369351), s.n. [30/8/59; Herb. Inst. Hist. Nat. 5267] (Mm); Braga, Moreira, & Lange 329 (Gg); Collector undesignated s.n. [Ponta Grossa, 1874] (Ja--46601); Dusén 8 (N, S), 2577 (Ja--46566, N), 2733 (Ja—46568), 3865 (Ja--46800), 7533 (Mi, N, S), 13239 (Mi, N), 13478, in part (S), 15149 (S), s.n. [Pirahý, 28.12.1903] (S), s.n. [Curityba, 25 Feb. 1904] (S), s.n. [Villa Velha, 13.3.1904] (S), s.n. [Curityba, 7.X.1908] (S), s.n. [Jaguariahyva, 24/10/1910] (S), s.n. (Ja—31105, N); H. M. Filho 87 [Herb. Mus. Paran. 5314; Herb. Curso Farmac. 720] (S); Hatschbach 599 (N), 1004 (N), 1453 (N), 2913 (N), 3369 (Sm), 3760 (Sm), 6903 (Mi), 8201 (Ca); Hatschbach & O'Curial 599 (N), 1599 (S); Hertel 24 [Herb. Mus. Paran. 1932] (N); F. C. Hoehne s.n. [Curitiba, Oct. 18, 1928] (N, N, Sp—23052), s.n. [Ponta Grossa, Nov. 2, 1928] (Sp—23330); M. Kuhlmann s.n. [São Luiz, Aug. 27, 1939] (N, Sp--41532); Lange 1048 [Herb. Inst. Hist. Nat. 5260] (Mm); Lourdes Camargo 42 [Herb. Mus. Paran. 4476] (N); Mattos 4720 (N, S), s.n. [R-20, no. 11; 9-11-51] (Sm); E. Meyer s.n. [20/12/58; Herb. Inst. Hist. Nat. 5259] (Mm); E. A. Moreira 27 (W--2369333), 54 (W--2369337), 113 (W--2369342), s.n. [2/1960] (Ih--5912); Moure s.n. [R-20, no. 10; 24-9-52] (Sm); Princesa Imperial s.n. [Campos Gerais, Dec. 1884; Herb. Saldanha 8738] (Ja—46542); Reiss 16a (I, N, S); Reitz 5722 (Cb); J. E. Rombouts s.n. [Ponta Grossa, July 17, 1938; Herb. Inst. Agron. Est. S. Paulo 2603] (Sp--41084, Sp); N. Santos s.n. [Araucaria, Feb. 1941] (Ja--46556); Stellfeld 1130 [Herb. Mus. Paran. 2232] (N), 2232 (S); Tessmann s.n. [Herb. Mus. Paran. 2497] (N), s.n. [Herb. Mus. Paran. 2527a] (N). Rio de Janeiro: O. M. Barth I.139 [Herb. Inst. O. Cruz 99] (W--2342878); Dusén 2035 (Ja—46563); Glaziou 5955 (S); Segadas-Vianna 756 (Ja), 3113 (Ja); Segadas-Vianna, Dau, Ormond, & Machilne 582

(Ja); Ule 640 [March 1894] (Ja--46525), 640 [Dec. 27, 1895] (Ja--46526). Rio Grande do Sul: Rambo 51405 (N), 54594 (B). Santa Catarina: Reitz 4295 [Herb. Barb. Rodr. 4746] (Le, W--2141712), 4500 [Herb. Barb. Rodr. 4739] (Le, W--2141734), 4516 [Herb. Barb. Rodr. 4742] (Le, N, S, W--2141737), 4750 (W--2268919), C.310 [Herb. Rio Jan. 51359] (N); Reitz & Klein 4750 (Ok), 4865 (W--2252076), 5244 (W--2252079), 5270 (W--2252080), 6458 (Rd); Smith & Klein 8428 (W--2249355), 11445 (Ok, W--2251783), 12118 (Ok, W--2251853); Smith & Reitz 8916, in part (W--2251466), 9162 (N, Ok, W--2251501), 9226 (Ok, W--2251513), 9839 (Ok, W--2251615); Smith, Reitz, & Sufridini 9315 (Ok, W--2251531), 9371 (Ok, W--2251539). São Paulo: Bailey & Bailey 824 (Ba, Ba, Ba), 921 (Ba); Brade 5739 (N, S, Sp-6713), 5740 (S), 12393 (Ja--46495); Campos Novaes 726 (W--389893); Frazão s.n. [Herb. Rio Jan. 16536] (N); Handro s.n. [Jabaquara, April 14, 1947; Herb. Inst. Bot. S. Paulo 54036] (N); Hashimoto 304 (Sp--42939); Hauff 16-35 (Sp--43059, Sp); Herter 4360 (N); F. C. Hoehne s.n. [São Bernardo, Oct. 23, 1918] (N, Sp--2535), s.n. [Santo Amaro, Oct. 21, 1917] (Sp--758), s.n. [Campos do Jordão, Sept. 19, 1923] (N, Sp--28656); W. Hoehne 1865 (N), 2274 (Mg, No), 2275 (Mg), 2276 (N); Hoehne & Gehrt s.n. [Santo Angelo, Oct. 20, 1936] (Be--39685, N, N, Sp--36577); M. Kuhlmann s.n. [Umuarama, Feb. 7, 1935] (K, Sp--32445), s.n. [Santo Amaro, Aug. 5, 1943; Herb. Inst. Bot. S. Paulo 45350] (N); Leite 3373 (El), xxvii (N); Löfgren & Edwall s.n. [Santo Amaro, July 29, 1894; Herb. Com. Geogr. & Geol. 2576] (N, Sp--15699); P. W. Lund s.n. [Mugi, Novembr. '33] (Cp, Cp); A. Lutz 517 (Hk); B. Lutz s.n. [Serra da Bocaina, Jan. 1925] (Ja--15048); Moldenke & Moldenke 19650 (Es, Mg, N, No, Ot, Sm), 19652 (Es, N, Sm); L. Netto s.n. (Ja--46796); Pickel 1287 (N), 1795 (N, Sf), 1974 (N, Sf), 5370 (W--1802779), 5509 (N); J. E. Pohl s.n. [1839] (Br); L. Riedel 1447 (N); L. Roth 361 [Herb. Inst. Bot. S. Paulo 48408] (N); Schwacke s.n. [Mogi das Cruces, April 19, 1889] (Ja--46587); Usteri s.n. [Herb. Inst. Bot. S. Paulo 15713] (N), s.n. [Moóca, Oct. 2, 1905] (N, Sp--15720), s.n. [Vila Mariana, Aug. 26, 1906] (Sp--15715). State undetermined: Bowie & Cunningham s.n. [Atacibata] (Bm); Ule s.n. [Herb. Rio Jan. 640] (N). ARGENTINA: Misiones: Niederlein 1742 (Ra--23608). CULTIVATED: Germany: Otto s.n. [Macbride photos 17420] (Kr--photo, N--photo, N--photo). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jard. Bot. Brux. s.n. (Br); Schauer s.n. [1845] (S).

VERBENA HIRTA var. GRACILIS Dusén, Arch. Mus. Nac. Rio Jan. 13: 36. 1903.

Bibliography: Dusén, Arch. Mus. Nac. Rio Jan. 13: 36. 1903; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 101.

1942; Moldenke, Alph. List Cit. 1: 170 & 172 (1946) and 2: 445 & 484. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94 & 198. 1949; Moldenke, Alph. List Cit. 4: 1248--1250. 1949; Moldenke, Phytologia 3: 74 (1949) and 3: 453. 1951; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Moldenke, Phytologia 4: 451. 1953; Angely, Fl. Paran. 7: 12. 1957; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 110 & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

This variety differs from the typical form of the species in being more slender and more lightly pilose, bright-green, much-branched; the branches 20--30 cm. long, ascending, 1--2 mm. in diameter; leaves sometimes very shortly petiolate, otherwise typical in form; inflorescence terminal, less robust than in the typical form.

The type of the variety was collected by Per Karl Hjalmar Dusén in a campo at the hill called Pedra Assentada, at an altitude of about 2300 meters, already past anthesis in May. Dusén 232, cited below from Minas Gerais, may actually have been collected in the state of Rio de Janeiro -- its label indicates that it was collected at Serra de Pedra, Serra do Itatiaia.

The variety has been collected on campos, shrubby campos, and riverbanks, at altitudes of 1000 to 2300 meters, flowering in January, May, October, and November. Its corolla is described as lilac or rose in color. Common names recorded by Reitz are "camaradinha", "formosa sem dote", and "jurupeba", names which, however, he lists for all the species in the genus from southern Brazil. Herbarium material has been misidentified and distributed as V. hirta Spreng. and V. strigosa Cham. Weir 319 was originally identified as "Verbena sp. near V. lobata Vell.", but is actually very typical V. hirta var. gracilis.

In all, 36 herbarium specimens have been examined by me.

Citations: BRAZIL: Minas Gerais: Dusén 232 (Ja--31106, S). Paraná: Ayrton de Mattos 4281 (N), 4594 (N), 4595 (N); Dusén 2974 (Ja--14864, Ja, S, W--1199460), 6798 (S, W--1481766), 8567 (N, S), 13239 (S), 13478, in part (S); Hatschbach 5124 (Sm), 6762 (Mi), 6796 (Mi); Mattos s.n. [R-20, no. 9; 5-11-50] (Sm), s.n. [R-20, no. 12; 18-4-51] (Sm); Moreira Filho s.n. [2/1960] (Ih--5910); Tessmann s.n. [Herb. Mus. Paran. 2516] (N); Weir 319 (Bm). Rio Grande do Sul: Rambo 35421 (N), 51940 (N, W--2102250). Santa Catarina: Reitz C.310 [S. F. 51359] (N), C.1542 (Rd); Reitz & Klein 7433 (Mm), 7449 (Mm), 7645 (Mm), 7934 (Mm); Smith & Reitz 10185 (W--2251659, Z). State undetermined: Dusén 2687 [Serrinha, Jan. 14, 1904] (Ja--46799), s.n. [Herb. Rio Jan. 31106] (N).

VERBENA HISPIDA Ruíz & Pav., Fl. Peruv. & Chil. 1: 22, pl. 34a. 1798.

Synonymy: Verbena tetrandra, spicis ternis, cylindricis; foliis ovatis oblongisque, integris & subtrifidis, profunde serratis, semiamplexicaulibus Ruíz & Pav. apud Poir. in Lam., Encycl. Méth.

Bot. 8: 550, in syn. 1808. Verbena glandulosa Moris, Ann. Stor. Nat. 4: 39. 1830. Verbena cuneifolia Hort. ex Walp., Repert. Bot. Syst. 4: 22, in syn. 1845 [not V. cuneifolia Raf., 1808, nor Ruíz & Pav., 1798, nor Wallberg, 1959]. Verbena glandulosa Morren ex Walp., Repert. Bot. Syst. 4: 33, nom. nud. 1845. Verbena clandestina Mart. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. Verbena hispida Pav. ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Verbena bonariensis x officinalis Regnell ex Moldenke, Résumé 359, in syn. 1959.

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List Invalid Names 23 & 24. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Castanea 13: 117, 119, & 121. 1948; Moldenke, Alph. List Cit. 2: 356, 357, 372—374, 377, 378, 402, 411, 413, 479, 490, & 599 (1948), 3: 660, 672, 690, 693, 694, 705, 713, 732, 733, 735, 746, 756, 767, 768, 798, 801, 807, 815, 847, 862, 869, 872, 880, 881, 883, 888, 893, 908, 913, 952, 957, & 968 (1949), and 4: 1010, 1079, 1088, 1090, 1091, 1093, 1133, 1158, 1168, 1175, 1192, 1203, 1215, 1233, 1257, 1293, & 1302. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73, 94, 98, 99, 101, 106, 108, 164, & 198. 1949; Moldenke, Phytologia 3: 76 (1949) and 3: 291 & 377. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 54. 1951; Moldenke, Phytologia 3: 467. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208 & 2211. 1951; Moldenke, Phytologia 4: 267 (1953), 5: 75 & 96 (1954), and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956: Soukup, Biota 1: 180. 1956; Cabrera, Revist. Invest. Agric. 11: 398. 1957; Moldenke, Am. Midl. Nat. 59: 342, 346, 348, 354, 356, & 359. 1958; Moldenke, Résumé 80, 85, 110, 115, 118, 121, 127, 129, 130, 223, 359, 362, 364, 366, 425, & 472. 1959; Moldenke, Résumé Suppl. 1: 8 (1959), 2: 11 (1960), 3: 13 & 41 (1962), and 4: 5. 1962; Maria, Pl. Vall. Cochab. 38. 1962; Moldenke, Résumé Suppl. 6: 6 (1963) and 7: 7. 1963.

Illustrations: Ruíz & Pav., Fl. Peruv. & Chil. 1: pl. 34a. 1798; Sanzin, Anal. Soc. Cient. Arg. Buenos Aires 88: 116. 1919; Junell, Symb. Bot. Upsal. 4: fig. 1--6, 9, 10, 12--15, & 18. 1934; Dermen, Cytologia 7: 163, fig. 13, & 165, fig. 27. 1936.

Rough-hairy perennial herb, mostly 25—50 cm. tall and decumbent or partially procumbent, rarely suffrutescent and to 1 m. tall, grayish or yellowish in drying; stems 1 to many, erect or ascending, often rigid, sometimes trailing or decumbent at the base, sharply 4-angled, hispid, many-branched; branches usually rigid, the lower ones sometimes prostrate and closely appressed to the ground; leaves sessile, decussate-opposite, varying from oblong to ovate-lanceolate or lanceolate, 4--10 cm. long, 1.5--2.5 cm. wide, acute or acuminate at the apex, cuneate-attenuate to the cordate-clasping base, soft-textured, coarsely and unequally serrate or incised, sometimes trifid or subtrifid, lineate-rugose above, strigose-hispidulous on the venation on both surfaces and hirtellous-pubescent on the lamina beneath, the teeth acuminate, very variable in size and position; venation prominent beneath, the larger parts usually impressed above; spikes terminal, often ternate, very dense and crowded, long- or short-pedunculate, cylindric, 3--8 cm. long, glandular-hispid or hirsute throughout; bractlets lanceolate, subulate at the apex, conspicuous, equaling or surpassing the calyx, glandular-hispidulous; calyx 2—2.5 mm. long, glandular-hispidulous, its teeth short, acute or subacute to subulate, and hairy; corolla varying from blue, clear-blue, bluish, very pale-blue, or purplish-blue to bluish-purple, purple, lilac-blue, lilac, pale-lilac, lavender, violet, pale-violet, light-violet, clear-violet, dark-violet, pinkish-mauve, pale-rose, or "steel-color", its tube about twice as long as the calyx, the limb 5-lobed, very small and inconspicuous, the interior of the throat sometimes white, the outside of the flower or base of the tube often white and the remainder of the tube pale-lilac; chromosome number: 2n = 14.

The type of this common and widespread species was collected by Hipólito Ruíz (*no. 1/34*) along torrents, in sandy soil, at Huanuco, Peru, and is deposited in the herbarium of the Jardin Botanico at Madrid; the unnumbered Ruíz & Pavon collections cited below are probably parts of the same collection. An isotype in the herbarium of the Botanisches Museum at Berlin was photographed by Macbride, but is now destroyed. The species is common in Andean Peru, Chile, Bolivia, and Argentina, but is found also in Paraguay, Brazil, and Ecuador and has been introduced as a weed in Switzerland and England. It was apparently introduced into cultivation in or about 1835 and is now known from gardens in many parts of the world. Bailey (1935) lists Kew as handling the seeds.

In its native haunts it inhabits both cultivated and uncultivated ground, fertile soil at the edge of woods, open grassy knolls, fields, wet places, dry barren scrubland, dry sandy riverbeds, wet places in sugarcane fields, sandy places and sand bars, streambanks, roadsides, and quebradas between pastures, and is often very abundant, frequently in full exposure to the sun. It has also been collected in low ground on campos, in and about cities, at the edge of montes, fertile campos, shady places, sandy playas, among rocks, in dry stony places, in the mountains, dry river valleys, campos, among weedy vegetation in hard gravelly ground, along the borders of old canals, at the foot of barrancas, near or between cultivated areas, and in old alfalfa fields, growing at altitudes of 10 to 4165 meters. It has been collected in anthesis in every month of the year, and in fruit in March and from July to December. Mandon asserts that it grows "everywhere in cultivated and uncultivated ground and grassy places" in the vicinity of Sorata, La Paz, Bolivia. Senn describes it as "a common trailing roadside weed in Andean South America". A. G. Schulz reports it as "abundant", and Jörgensen says that it is abundant in potreros; Parodi describes it as adventive in cultivated ground. Ruiz Leal states that it is abundant in wet mattorales in the mountains, Eyerdam found it associated with *Stipa*, *Juncus*, *Salvia*, etc., among stones in red clay, while, in Peru, Rauh & Hirsch found it in the *Adesmia* zone of vegetation. Krause found it growing as a weed and in rubbish at one of the botanical gardens in Germany. In Chile it has been found growing as low as 10 meters altitude, in Argentina from 500 to 3600 meters, in Peru from 2800 to 3900 meters, and in Bolivia from 2600 to 3700 meters.

Rojas 13561, from Paraguay, is said to have "petals white, outside of tube pale lilac". *Stafford 1206*, at Kew, from an altitude of 10,500 feet at Arequipa, Peru, is anomalous in having slender spikes that are not so densely flowered.

Material of this species has been misidentified and distributed in herbaria under the names *V. alata* Cham., *V. bonariensis* L., *V.*

bonariensis var. longibracteata Kuntze, V. cuneifolia Ruíz & Pav., V. gracilis Cham., V. hastata L., V. lasiostachys Link, V. litoralis Kunth, V. littoralis H.B.K., V. littoralis Kunth, V. rigida var. intermedia (Gill. & Hook.) Farwell, and V. venosa Gill. & Hook. On the other hand, the Buchtien s.n. [Valdivia, 1898] and Venturi 525, distributed as V. hispida, are V. bonariensis L.; Cárdenas 3019 is V. brasiliensis Vell.; Claude-Joseph 5823 and H. Krause s.n. [Coral] are V. corymbosa Ruíz & Pav.; Soukup 259 is V. hayekii Moldenke; Killip & Smith 21925 and Pérez Arbeláez 1207 are V. litoralis H.B.K.; Buchtien 135 & 5887, Herrera s.n. [Cuzco, July 1923], Killip & Smith 21541, 21855, & 22142, and Ledig 33 are V. parvula Hayek; and Rose & Rose 19072 is V. villifolia Hayek.

Junell (1934) discusses and illustrates the gynoecium morphology of V. hispida. Common names recorded for the species are "bristly vervain", "hairy verbena", "verbena", and "verveine hispide".

The type of V. clandestina is Herb. Martius s.n., collected from material grown in the botanical garden at Munich, Germany, in 1839, and deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. The type of V. bonariensis x officinalis is Regnell s.n., collected in August, 1897, from material grown in a garden in Sweden and deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. It is worthy of note here that the V. cuneifolia of Rafinesque, referred to in the synonymy, is V. stricta Vent., that of Wallberg is V. simplex Lehm., while that of Ruíz & Pavon is a valid species.

Gay (1849) reports that "Esta es muy comun en las provincias centrales, Valparaiso, Quillota, Santiago, etc. Florece en setiembre, etc." Reiche (1910) says "Desde el Perú al traves del Norte de Chile hasta las provincias centrales; tambien en las cordilleras bajas." Its hybrid with V. bonariensis L. is xV. dermeni Moldenke, with V. hastata L. is xV. noacki Moldenke, with V. lasiostachys Link is xV. lecocqi Moldenke, with V. litoralis H.B.K. is xV. bealei Moldenke, with V. officinalis L. is xV. meretrix Moldenke, with V. simplex Lehm. is xV. prostibula Moldenke, and with V. urticifolia L. is xV. fabricata Moldenke, which see.

Walpers (1845) cites Poeppig I.158 "in cultis" near Concan, Chile, and Schauer (1847) says of this collection "forma foliis eximie laciniatis". The latter author cites in addition Pentland s.n. from Bolivia; Mertens s.n., Philippi s.n., and J. Styles s.n. from Valparaíso, Chile; Bertero s.n. from Quillota and from Santiago, Chile; and Meyen s.n. from Mellipilla. Herrera (1941) cites Hicken s.n. [1903] and Herrera s.n. [Oct. 1929] from Cuzco, Peru. Raimondi (1943) cites his nos. 7372, 7595, and 7727 from Cajamarca, 9587 and 10513 from Puno, 11033 from Cuzco, and 10683 and 10693 from an undetermined department, Peru. Cabrera (1957) cites Keidel s.n. from Jujuy, Argentina. The species is recorded by P. M. Hall (1939) from Jackdaw Lane, Oxford, where it was collected by J. P. M. Brenan and J. Chapple, and is also recorded as naturalized in England by Douglas H. Kent in a letter to me dated November 28, 1949. Maria (1962) cites his no. 181/4d from Cochabamba, Bolivia. The Loud., Hort. Brit. Suppl. reference given in the bibliography of this species is sometimes erroneously accredited to W. Baxter.

Acevedo de Vargas (1951) cites the following 13 specimens not as yet seen by me: CHILE: Aconcagua: Landbeck s.n. [XII.1860] (Sg--54692, Sg--54695). Coquimbo: Reiche s.n. [I.1899] (Sg--68332). Linares: Collector undesignated s.n. [I.1877] (Sg--42309, Sg--54693). Maule: Collector undesignated s.n. [Constitución] (Sg--68329), s.n. (Sg--54696). O'Higgins: Bertero s.n. [IV-V.1828] (Sg--54691). Santiago: Collector undesignated s.n. [XI.1895] (Sg-42510, Sg--54694). Tarapacá: Kuschel s.n. [5.XII.1946] (Sg--66204); Rahmer s.n. [III.1885] (Sg--42308). Valparaíso: Buchtien 140 (Sg--68331).

In all, 216 herbarium specimens, including type material of all the names involved, and 14 mounted photographs have been examined by me.

Citations: ECUADOR: Azuay: Asplund 17805 (S); Giler 23 (W--2059686). PERU: Arequipa: Munz 15487 (N, Po--255349); Sandeman 3793 (K), 3850 (K); D. Stafford 622 (K), 1206 (K). Cuzco: Rose & Rose 19072 (N). Huánuco: Pavon s.n. [Macbride photos 24686] (Kr--photo, N--photo); H. Ruíz 1/34 [Macbride photos 29686] (Kr--photo of type, N--photo of type, Q--type), s.n. [Peruvia et Chili; Macbride photos 17555] (Br--isotype, F--photo of isotype, N--photo of isotype, N--photo of isotype, N--photo of isotype, Si--photo of isotype, Z--photo of isotype). Junín: Soukup 2948 (W--1564077). Lima: Kunkel 388 (Gg); F. W. Pennell 14582 (N, S, W--1340869); W. E. Safford s.n. [Rimac, Aug. 29, 1887] (C); Wilkes s.n. [Obrajillo] (W--65025). Puno: Shepard 11 (N); Soukup s.n. [July 8, 1938] (Ew). Tacna: H. H. Rusby 909 (C, Mi, Pa). Department undetermined: Haenke 1762 (N); Mathews 497 [Peruvia interiore, 1862] (M); Meyen s.n. (Br); Rauh & Hirsch P.592 [Chiquate] (Z). BRAZIL: São Paulo: Pickel 946 (Sf, W--1564383), s.n. [Herb. Serv. Florest. S. Paulo 946] (N). BOLIVIA: Cochabamba: Diers 749 (Ko); Eyerdam 24948 (Ca--649066); A. Jimenez 96 (W--2369935); Julio II.211 (W--1542919); Senn 4071 (N, W--2034330); Steinbach 8729 (W--1857440). El Beni: Buchtien 5888 (W--1159357). La Paz: Asplund 142 (Us), 458 (Us), 938 (Us), 3750 (S, Us); M. Bang 8, in part (C, N, W--71965); Buchtien 135 (V), 196 (N), 759 (V, W--1159356), 4683 (W--1159364), s.n. [La Paz, März 1910] (La, S, Ug); Hammarlund 167 (S), 196 (S), 516 (S); Mandon 523 (S); R. S. Williams 5 (N).

Oruro: Asplund 3352 (Us). Potosí: Cárdenas 327 (W--1573314). Tarija: Hammarlund 288 (S). Titicaca Island: Bandelier 13 (N). PARAGUAY: Hassler 2459 (N, V); Pedersen 4018 (W--2283644); T. Rojas 313 (S), 355 (B, Bm), 1890 [Herb. Hort. Parag. 10063; Herb. Osten 13561] (N, Ug, W--1858377), 2514 [Herb. Osten 18176] (N, Ug), 13561 (S), s.n. [Hassler 2459] (S). CHILE: Aconcagua: Reiche 16 (N). Arica: Jaffuel 1625 (W--1617846). Colchagua: Barros Valenzuela 8048 (N), 8049 (N); Bertero s.n. [Racangua] (Br). Concepcion: Barros Valenzuela 8224 (N). Santiago: R. A. Philippi 1300 (W--1323096); Sparre 2346 (S); Wilkes s.n. [Santiago] (W--71952). Valparaíso: Buchtien s.n. [18.IX.1895] (W--1159366); Claude-Joseph 3549 (W--1283380); Garaventa 2106 [Herb. Looser 4027] (N); Looser 4505 (N). Province undetermined: Cuming 417 (Br, F--photo, N--photo, Si--photo, Z--photo), s.n. [1835] (Br). ARGENTINA: Catamarca: Jörgensen 1021 [Herb. Osten 11427] (Ca--195443, Ug, W--704748); Venturi 7229 (Gg--161384). Chaco: Buratovich 17 (N); Parodi 12811 (N); A. G. Schulz 1482 (N), 6387 (N). Córdoba: Burkart 10411 (N); Castellanos s.n. [Herb. Osten 15285] (Ug); E. Fielding s.n. [Cordova] (Bm); Osten 10611 (Ug); Troncoso 319 (N), 6025 (W-1858387); Villafane 171 (N). Formosa: Jörgensen 2632 (W--1065618), 2638 [Herb. Inst. Miguel Lillo 31322] (N, N); I. Morel 77 (N), 215 (N), 311 (N), 1177 (N), 1854 (N); Pierotti 4080 (N). Jujuy: Claren 11558 (S); R. E. Fries 509 (N, S); Garolera & Romero 14 (N); Kuntze s.n. [Jujuy, Oct. 1892] (N, W--701718); Moldenke & Moldenke 19750 (Lg, N); Venturi 5370 (Ca--376416, Du--372500, Gg-158645, Vi, W--1591471). Mendoza: Dawson & Pujals 1449 (N); Jensen-Haarup s.n. [Santa Rosa, 1904] (W--1081084); Ruiz Leal 1172 (N), 2026 (N), 3054 (N), 5593 (N), 6761 (N), 8422 (N), 8800 (N), 8987 (N), 9049 (N), 9328 (N), 9337 (N); Semper s.n. [7-V-1944] (N). Misiones: Ekman 2027 (S). Salta: Garolera & Romero s.n. [19-I-1947] (N), s.n. [21-I-1947] (N); Lillo 11013 [Herb. Osten 8467] (Ug); T. Meyer 3446 [Herb. Inst. Miguel Lillo 17334] (Ca--882872, N), 4870 (Ca--906604, N, Si); Moldenke & Moldenke 19735 (Es, Lg, N); O'Donell 4801 (N); D. Rodriguez 161 [Herb. Inst. Miguel Lillo 31317] (Ca--3315, N, W--1858262); Sparre 1177 (S, S); Venturi 3702 (Du--372476, W--1343305); Wall & Sparre s.n. [northwest of Salta, 4/12/46] (Ew). San Juan: Castellanos 15191 (W--2198237); Cuezzo 1596 (N), Santa Fé: Balegno 496 (N); C. Meyer s.n. [T. Meyer 3273] (N). Tucumán: Baer 7 (S); Bruch 2724 (N); Lillo 923 [Herb. Osten 8466] (Ug), 5201 [Herb. Inst. Miguel Lillo 31329] (N), 7451 [Herb. Osten 8468] (Ug), 8694 [Herb. Osten 8465] (Ug), 15290 [Herb. Osten 8453] (Ug); Monetti 359 [Herb. Osten 10876] (Ug), 1807 [Herb. Inst. Miguel Lillo 31319] (N), 3015 [Herb. Inst. Miguel Lillo 3015] (N); Schreiter 2359 [Herb. Inst. Miguel Lillo 32785] (N, N), s.n. [Herb. Osten 12179] (Ug); Venturi 53 [Herb. Osten 17241] (Ug, W—1591210), 520 (W—1591222), 825 [Herb. Inst. Miguel Lillo 31331] (Ca—3311, N, N), 2767 (W—1591267). GERMANY: E. H. L. Krause 29135 (B), 31938 (B). SWITZERLAND: Aellen s.n. [Basel, Schutt bein Klein-Riehen] (Go); Collector undesignated s.n. (W—264440). CULTIVATED: Belgium: M. Martens s.n. [hort. insul. 1837] (Br), s.n. [h. b. lov. 1840] (Br). England: Nelmes 1202 (Ba). France: Herb. Harvey s.n. [h. R. P. 1835] (Du—166472), s.n. [h. R. P. 1843] (Du—166471), s.n. [h. P. Septb. 1849] (Du—166469); Herb. Jard. Bot. Brux. s.n. (Br). Germany: Herb. Götting. 2109 (S); Herb. Martius s.n. [hort. Monac. 1836] (Br, Br), s.n. [h. Monac. 1839] (Br), s.n. [hort. Monac. 1843] (Br). Italy: Herb. Harvey s.n. [Bellovaco ex seminib. h. R. P. 1841] (Du—166470). Massachusetts: L. H. Bailey s.n. [Cambridge, June 21—23, 1919] (Ba), s.n. [Cambridge, Aug. 31, 1921] (Ba), s.n. [Cambridge, August 6—12, 1929] (Ba). New Jersey: Guyot s.n. (Pr). New York: Bastedo s.n. [22 Au. 1897] (N); Burdick s.n. [Sept. 26, 1922] (Ba). Sweden: Blom s.n. [1929] (Go); Collector undesignated s.n. [e semina Helsingfors in H. L.] (Lu); Regnell s.n. [8/1897] (S); Vestergren s.n. [25/10/1923] (S). Switzerland: Herb. Hort. Bot. Basil. s.n. [5.7br.1840] (M). LOCALITY OF COLLECTION UNDETERMINED: Beyrich s.n. [1833] (S); Herb. Meisner s.n. [15.7br.42] (Mi); Née 110 (Q); E. W. White 24 [Yacusula] (Bm).

VERBENA HOOKERIANA (Covas & Schnack) Moldenke, Phytologia 2: 148. 1946.

Synonymy: Verbena crithmifolia var. minor Gill. & Hook. in Hook., Bot. Misc. 1: 169. 1829. Verbena crithmifolia β minor Walp., Repert. Bot. Syst. 4: 30. 1845. Verbena crithmifolia β minor Schau. in A. DC., Prodr. 11: 556. 1847. Glandularia hookeriana Covas & Schnack, Revist. Argent. Agron. 12: 57—59, fig. 1. 1945. Verbena crithmifolia f. minor Gill. & Hook. ex Covas & Schnack, Revist. Argent. Agron. 12: 59, in syn. 1945. Verbena crithmifolia β minor Gill. & Hook. ex Moldenke, Résumé 363, in syn. 1959. Verbena erythmifolia Gill. & Hook. ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963. Verbena eurythmifolia Gill. & Hook. ex Moldenke, Résume Suppl. 6: 10, in syn. 1963.

Bibliography: Hook., Bot. Misc. 1: 169. 1829; Walp., Repert. Bot. Syst. 4: 30. 1845; Schau. in A. DC., Prodr. 11: 556. 1847; Covas & Schnack, Revist. Argent. Agron. 12: 57—59, fig. 1. 1945; Cabrera, Bol. Argent. Soc. Bot. 1: 67. 1945; Schnack & Covas, Darwiniana 7: 71 & 72. 1945; Moldenke, Alph. List Cit. 1: 375, 378, 442, 586, 598, 626, & 629. 1946; Moldenke, Phytologia 2: 148 (1946) and 2: 338. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 10. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 65. 1948; Moldenke, Alph. List Cit. 3: 673, 735, 896, 909, 910, & 951

(1948) and 4: 1172, 1196, 1197, & 1200—1202. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Phytologia 3: 290 (1950) and 3: 454 & 485. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 101 & 263. 1953; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; Moldenke, Résumé 127, 296, 363, & 472. 1959; Moldenke, Résumé Suppl. 3: 14 & 37 (1962) and 6: 7. 1963.

Illustrations: Covas & Schnack, Revist. Argent. Agron. 12: 58, fig. 1. 1945.

Prostrate spreading herb or else subshrub or shrub to 80 cm. tall; stems sometimes very woody, cylindric-tetragonal, pubescent with simple, oblique, antrorse hairs about 0.3 mm. long intermixed with glanduliferous hairs about 0.05 mm. long; leaves decussate-opposite; petioles 0.8--1.2 cm. long; leaf-blades ovate in outline, 2.5--4 cm. long, 0.8--2.5 cm. wide, laciniate, pubescent, attenuate at the base into the petiole, the laciniations to 2.5 mm. wide, obtuse at the apex, revolute along the margins, the hairs simple, subappressed, about 0.3 mm. long, intermixed with a very few sessile glands; inflorescence spicate, the spikes abbreviated, solitary, binary, or ternate, elongate after anthesis; bractlets linear-lanceolate, 4--5 mm. long, acute at the apex, ciliate on the margins with simple hairs about 0.2 mm. long, pilose on the back and margins with glanduliferous hairs about 0.05 mm. long; flowers very fragrant; calyx tubular, 6—7 mm. long, pubescent with simple and glanduliferous hairs similar to those on the bractlets, the teeth short and equal; corolla varying from blue, clear-blue, blue-lilac, or bluish-white to lilac, lilac-rose, pale-rose, rose, violet, violet-pink, purple, or "purplish-white, turning pale-purple", puberulent on the outer surface with glanduliferous hairs about 0.06 mm. long intermixed with a very few scattered simple hairs; stamens typical, the two upper ones without glandular appendages but with glanduliferous hairs along the margins of the filaments and at the base of the connective; pistil typical, about 7.5 mm. long; cocci oblong, about 4 mm. long, cylindric-fusiform, ventrally recurved at the apex, the ventral surface densely hirsute, surrounded by an alate margin about 0.5 mm. wide; chromosome number: 2n = 20.

The type of this species was collected by Guillermo Covas (*no. 2106*) between La Paz and Desaguadero, in the department of La Paz, Mendoza, Argentina, on December 15, 1943, and is deposited in the herbarium of the Instituto de Botánica Darwinion at San Isidro.

Walpers (1845) and Schauer (1847) describe their *V. crithmifolia β minor* as differing from typical *V. crithmifolia* in having the "foliis angustioribus", by which they undoubtedly mean that the leaf-segments are narrower, which is very true. Schauer cites *Gillies s.n.* [In prov. S. Louis rep. Argentinae] as the type, but adds the comment "conf. *V. filicaulis*". For *V. crithmifolia* itself, which he places in his group of "Species non satis notae", he says "Conf. *V. pinnatisecta*", apparently indicating his doubts as to their validity. Actually neither of these taxa has any close relationship to the species which he suggests except for a very superficial leaf-resemblance.

Covas & Schnack (1945) make the following comments: "Esta especie es afín a *G. crithmifolia* (Gill. et Hook.) Schnack et Covas, de la cual fué considerada como una forma por Gillies y Hooker... Las diferencias entre ambas entidades son lo suficientemente marcadas como para considerarlas especies distintas. Ambas pueden diferenciarse así:

A. Hojas con lacinias generalmente menores de 2 mm. de ancho; pelos foliares subapretados. Anteras superiores sin apéndices glandulares. Pelos glandulosos del cáliz y de las brácteas menores que los pelos simples. Pelos del exterior de la corola en su mayor parte glandulosos. Mericarpios de 4 mm. de largo con el ápice recurvado hacia la cara ventral.......... *G. Hookeriana*.

AA. Hojas con lacinias generalmente mayores de 2,5 mm. de ancho. Pelos foliares erectos, rígidos, muy cortos, dando a la hoja aspecto escabroso. Anteras superiores con largos apéntices glandulares claviformes, exsertos. Pelos glandulosos de las brácteas y cáliz iguales o mayores que los pelos simples. Pelos del exterior de la corola simples. Mericarpios de 5 a 6 mm. de largo con el ápice no recurvado.....*G. crithmifolia*."

They comment further: "*G. Hookeriana* y *G. crithmifolia* tienen 2n = 20 chromosomas, siendo ellos de menor tamaño que en las especies diploides de *Glandularia* (2n = 10).....Al parecer las áreas de dispersión de *G. Hookeriana* y de *G. crithmifolia* no se superponen. *G. Hookeriana* crece en las sierras de Córdoba y San Luis y en la llanura la región limítrofe de Mendoza y San Luis. *G. crithmifolia* crece, dentro de la Prov. de Mendoza, en la región precordillerana y en la llanura adyacente."

Verbena hookeriana inhabits campos, barrancas, flat uplands, and dry land, often in the mountains, and has been found at altitudes of 50 to 3500 meters, blooming from September to May and in July, fruiting from January to May and in November. Bartlett found it "in the uplant plant association called 'monte de calden'", "in loess soil of flat *Larrea cuneifolia* association", and growing with *Gomphrena* and *Mitracarpus megapotamicus*. Eyerdam, Beetle, & Grondona state that it forms "large clumps sometimes abundant over wide areas in semi-open fields, in low sandy rolling hills, shrub formation". Jörgensen reports it as abundant at Andalgalá, Catamarca; Kurtz says that it is very common in dry ground at Los Romeros, Córdoba; Senn found it "very common" in La Pampa; and Hunziker reports it as a "frequent shrub" near Ojo de Agua, Santiago del Estero. A common name reported for it is "cola leche".

Herbarium material has been misidentified and distributed under such names as *V. crinoides* Lam., *V. crithmifolia* Gill., *V. crithmifolia* Gill. & Hook., *V. critmifolia* Gill., V. *erinoides*

Lam., and Glandularia laciniata (L.) Schnack & Covas. Covas & Schnack (1945) cite also a Ruiz Leal s.n. [Herb. Esc. Agron. Mendoza 3098] from Mendoza, not as yet seen by me. Chicchi 28 exhibits very woody stems, while Vervoorst 4252 and Sanzin 1563 show very plainly the upper stamens without the glandular appendages so noticeable in V. crithmifolia.

In all, 137 herbarium specimens, including type material of most of the names involved, have been examined by me.

Citations: ARGENTINA: Buenos Aires: H. H. Bartlett 19918 (Ca--772196, Mi, W--1904747); Castellanos s.n. [Herb. Osten 15287] (Ug); Chicchi 28 (N, N); Eyerdam, Beetle, & Grondona 23443 (Ca--627511). Catamarca: H. H. Bartlett 20231 (Ca--772042, Mi, N, W--1904895); Brizuela 53 (N), 385 (Gg--352666, N), 404 (Gg--353267, N), 516 (N), 870 (N), 978 (N), 996 (N), 1257 (N); Brücher & Brücher s.n. [25/12/48] (S), s.n. [28/12/48] (Lu); Castillón 14210 [Herb. Osten 8449] (Ug), 14212 [Herb. Osten 8448] (Ug), s.n. [Quebrada del Tala; Herb. Inst. Miguel Lillo 31738] (N), s.n. [Herb. Inst. Miguel Lillo 31740] (Du--317596, N, N); Hessling & Barkley 19Ar619 (N); Job 1337 (N); Jörgensen 1019 [Herb. Inst. Miguel Lillo 31743 & 31744; Herb. Osten 11429] (Ca--202604, N, N, N, Ug, W--704746, W--1591497); Luna Risso 479 (Es, N); Peirano s.n. [Herb. Inst. Miguel Lillo 32846] (Vi); Schreiter 6428 [Herb. Inst. Miguel Lillo 32749; Herb. Osten 22969] (N, N, Ug), 10612 [Herb. Inst. Miguel Lillo 32861] (N, N, W--71974), s.n. [Herb. Inst. Miguel Lillo 86242] (Ca, Ca--164804); Soriano 847 (N); Venturi 6725 (W--1591497); Vervoorst 4252 (Le); Wall & Sparre s.n. [Andalgalá, 27/11/46] (Ew, Ew, Ew). Chubut: Scolnik 358 (Er, N). Córdoba: H. H. Bartlett 20149 (Ca--772477, Mi, N, W--1904869); Burkart 20914 (Au--175468); Cabrera 6391 (N); Castellanos s.n. [Herb. Mus. Arg. Cienc. Nat. 31202] (N); A. T. Hunziker 7474 (N); Isler 117a (W--1473338); F. Kurtz 8440 (N), s.n. [Los Romeros, Jan. 18, 1895] (Ja--1886); Lorentz s.n. [Herb. Krause 16831] (Ca--453755), s.n. [Südlich von El Chañar, 28 Nov. 1871] (W--1134903); Lorentz & Hieronymus s.n. [1873] (C); Lossen 9 (Um--52); O'Donell 4525 (N); O'Donell & Rodriguez 358 (Ut--115404b), 597 (Ut--115420b); Sota 4092 (Vi); Villafane 273 (N), 324 (N), 388 (N). La Pampa: H. H. Bartlett 19934 (Mi, W--1904764); A. Burkart 9876 (Ug); Cabrera 4362 (N, Ug--8067); Chiochi 264, in part (N), 287 (N); A. T. Hunziker 4123 (N); Senn 4197 (N, W--1995282). La Rioja: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33881] (N, N); M. P. Gomez s.n. [Iliar; Herb. Inst. Miguel Lillo 106844] (Ca--164802, N, S); Hieronymus & Niederlein s.n. [Herb. Osten 13020] (Ug); T. Meyer 4090 (N, N, W--1909141), 4286 (Ca--79153, Ca--905933, N); Venturi 7816 (W--1591392). Mendoza: Ruiz Leal 8990 (N), 9400 (N), 9510 (N). Río Negro: H. H. Bartlett 19955 (Ca--772025, Mi, W--1904780); O'Donell 1553 (W--1931465), 1693 (S); Scala 11 (N, Ug, Ug). Salta: Venturi 6939 (W--1591505). San Juan: H. H. Bartlett 19550 (Mi, W--1904559). San Luis: Gillies s.n. [Sn. Luis] (Lu); Kuntze s.n. [San José de Morro, 3/I/92] (N, N, W--701713); Miers s.n. [Río Quinto] (Bm); Ruiz Leal 10441 (N); Sanzin 1563 [Herb. Osten 14639] (Ug); Terribile 765 (N); Troncoso 6021 (Tl, W--1858386); J. D. Varela 457 (N), 484 (Gg--353268, N), 516 (N), 547 (S), 590 (S), 653 (S), 732 (S). Santiago del Estero: A. T. Hunziker 8051 (N). Province undetermined: Jameson s.n. [in Republica Argentina, 1846--69] (W--1544547).

VERBENA HUMIFUSA Cham., Linnaea 7: 271--272. 1832.

Synonymy: Verbena chamaedrifolia Briq., Arkiv Bot. 2 (10): 10, in syn. 1904 [not V. chamaedrifolia Juss., 1821, nor L., 1878]. Verbena reineckii Moldenke, Phytologia 1: 480. 1940. Verbena humitusa Augusto, Fl. Rio Grande do Sul 211, sphalm. 1946. Verbena reineckii (Briq.) Moldenke, Résume Suppl. 3: 40, in syn. 1962.

Bibliography: Cham., Linnaea 7: 271--272. 1832; Walp., Repert. Bot. Syst. 4: 29--30. 1845; Schau. in A. DC., Prodr. 11: 538. 1847; Schau. in Mart., Fl. Bras. 9: 184. 1851; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147. 1894; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 3: 163. 1899; Lindman, Veget. Rio Grande do Sul 110. 1900; Briq., Arkiv Bot. 2 (10): 10. 1904; Herter, Florul. Urug. 105. 1930; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Phytologia 1: 480 (1940) and 1: 511. 1941; Moldenke, Lilloa 6: 331. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 41, & 101. 1942; Augusto, Fl. Rio Grande do Sul 209, 211, & 232, fig. 96. 1946; Moldenke, Alph. List Cit. 1: 264. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 24. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 2: 467, 485, & 601 (1948), 3: 665, 687, 848, & 923 (1949), and 4: 1164, 1286, & 1303. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 99, 100, & 198. 1949; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951; Rambo, Sellowia 6: 60, 84, & 153. 1954; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 110, 118, 119, 366, 373, & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Moldenke, Résumé Suppl. 3: 37 & 40. 1962.

Illustrations: Lindman, Veget. Rio Grande do Sul 110. 1900; Augusto, Fl. Rio Grande do Sul fig. 96. 1946.

Suffruticose-decumbent herb, creeping; stems slender or filiform, often whip-like, very long, prostrate, ascending at the tips, more or less hirsutulous and puberulent or hirsute and hirtellous, less so in age; nodes usually rooting; principal internodes more or less elongate, often greatly so, usually 1--3 cm. long; branches ascending; leaves decussate-opposite; petioles very slender, to 5 mm. long and sparsely hirsutulous, or obsolete;

leaf-blades chartaceous, rather uniformly bright-green on both surfaces, ovate or ovate-elliptic or even subrhomboid, 0.5—2.5 cm. long, 0.3—2 cm. wide, acute or subacute at the apex or sometimes rounded-obtuse, cuneate-attenuate into the petiole at the base and there entire-margined, widened toward the apex, sparsely scabrous-pilose with bulbous-based hairs above or strigose-hispid along the margins, hirsutulous or strigose-hispid along the venation and margins beneath, the margins coarsely dentate or crenate-serrate toward the apex, often deeply laciniate or trilobate with broad obtuse lobes, the middle lobe 3—5-dentate, the lateral ones usually 2-dentate; venation 3-plinerved, the midrib and the 2 or 3 secondaries very slender, the latter once or twice bifurcate, all impressed above, sharply prominulous beneath; veinlet reticulation very sparse, usually obscure; inflorescence axillary and terminal, subcapitate-spicate, 8—15-flowered; peduncles slender, hirsutulous, solitary or ternate, 1—2.5 cm. long, usually elongate or, when ternate, the central one shorter; bractlets lanceolate or ovate-lanceolate, about 1/3 as long as the calyx, about 4 mm. long and 1 mm. wide, hirsutulous, attenuate at the apex; flowers subopposite, patulous, eventually the pairs separated by distinct sympodia; calyx tubular, 8—9 mm. long, hirtous or hirsutulous, the hairs sometimes gland-tipped, often colored, herbaceous-costate, the ribs ending in very short and often unequal mucros; corolla varying from blue to violet or azure-violet, glabrous on the outside, its tube 1.2--1.5 cm. long, ampliate toward the apex, villous at the insertion of the stamens within, the throat barbate, the limb about 1 cm. in diameter, 5-lobed, the lobes emarginate; style sometimes scarcely exserted, sometimes long-exserted from the calyx after the corolla has fallen; fruiting-calyx turgid, contorted above; fruit about 4 mm. long, included by the fruiting-calyx; cocci pale, striate and scrobiculate-areolate on the dorsal surface, the commissural surface acute-angled and granulate.

This species was based on several collections made by Friedrich Sellow in "Brasilia meridionalis", deposited originally in the herbarium of the Botanisches Museum at Berlin, where one was photographed by Macbride, but now all destroyed. It has been collected in grassy fields, dry grassy fields, on sunny hills, in dry sandy-gravelly soil on hills, and on campos, flowering from September to November.

Walpers (1845) places the species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia, with ten other species. Briquet (1895) places it in his Section Verbenaca, Subsection Nobiles. The V. chamaedrifolia of Jussieu and of Linnaeus, cited in the synonymy above, are both synonyms of V. peruviana (L.) Britton. V. humifusa var. reticulata Moldenke is a synonym of V. marrubioides Cham.

Herbarium material of V. humifusa has been misidentified and distributed under the names V. chamaedrifolia Juss., "V. chamaedrifolia Juss. forma", V. erinoides Lam., V. marrubioides Cham., and V. supina L. On the other hand, the Dusén 15714 distributed as V. humifusa is actually V. marrubioides Cham.

Briquet (1904) comments as follows: "C'est à tort que nous avons jadis réuni cette espèce (Reineck et Czermak, Pl. exsicc. Bras. merid. n. 13) avec le V. chamaedrifolia. Elle s'en distingue en effet suffisamment par ses tiges couchées ou rampantes, ses feuilles profondément trilobées et incisées-crénulées, son calice à côtes longuement poilues-coliées, à poils mêlés de quelques glandes stipitées, à champs interneuraux glabrescente, etc. etc."

Augusto (1946) cites Augusto & Edésio s.n. [Morro de Glória, Porto Alegre] from Rio Grande do Sul, and spells Carl Axel Magnus Lindman's surname "Lindmann" in error. Lindman A.283 is cited by Briquet (1904) as "Exp. I. Regn. A.283".

In all, 29 herbarium specimens and 5 mounted photographs, including type material or phototypes of all the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Collector undesignated 554 (Ja--46594); Henz 32545 (N, Rb); Jurgens 20 (Ja--17763); Leite 662 (N); Lindman 283 (Ja--28163), A.283 (S, S); Moldenke & Moldenke 19855 (N); Rambo 29105 (N), 43261 (N), 43845 (N), 48804 (N), 48827 (N), 48911 (N), 49013 (Lm, N), 57298 (S); Reineck & Czermak 21 [Herb. Osten 4160] (N, N--photo, Po--63874, Po--63876, S, Ug). State undetermined: Sellow s.n. [Campos de Brasil meridional; Macbride photos 17421] (Kr--photo of cotype, N--photo of cotype, N--photo of cotype). PARAGUAY: Hassler 9479 (Bm, N, N, S, V). URUGUAY: N. J. Andersson s.n. [Monte Video, 1852] (S).

xVERBENA HYBRIDA Voss ex Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1263--1264 [as "V. hybrida Hort."]. 1873 [not V. hybrida Bicknell, 1941].

Synonymy: Verbena buistii Harrison, Floricult. Cab. 8: 160. 1840. Verbena hendersonii Hort. ex Harrison, Floricult. Cab. 8: 160 & 184. 1840. Verbena teucrioides var. anais Lem., Horticult. Univ. 3: 9. 1842. Verbena teucrioides var. anaïs Lem., Horticult. Univ. 3: 9. 1842. Verbena melindres latifolia Bohn, Florists' Journ. 5: 41. 1844. Verbena hendersonii Bohn, Florists' Journ. 5: 41, fig. 1. 1844. Verbena hybrida var. auriculiflora Hort. ex Vilm., Illustr. Blumeng., ed. 1, 1264. 1873. Verbena hybrida var. Hort. ex Vilm., Illustr. Blumeng., ed. 1, 1265. 1873. Verbena teucrioides auriculiflora Regel, Gartenfl. 28: 372. 1879. Verbena hybrida Hort. ex Lindman, Kongl. Svensk. Vetens.-Akad. Handl. 21 (4): 9 & 16--17, pl. 1. 1884. Verbena hybrida grandiflora elegans Regel, Gartenfl. 36: 668. 1887. Verbena hybrida var. auriculaeflora Vilm., Album de Clichés 707, fig. 25655. 1888. Verbena hybrida erecta compacta Blanc, Mammoth Verbenas. 1888. Verbena grandiflora auriculaeflora Blanc, Mammoth Verbenas. 1888. Verbena

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Perennial herb, usually treated as an annual in gardens in temperate climates, half-hardy in protected places, of spreading or compact growth, 15—45 cm. tall when in bloom; stems mostly procumbent, trailing or creeping, or ascending in compact forms, sometimes forming perennial mats 1 m. wide, slender, tetragonal, usually 30—60 cm. long, occasionally to 1 m. long, densely hirsute or villous; branches numerous, decumbent or ascending, slender, tetragonal, more or less densely soft-hirsute or villous with spreading hairs; nodes slightly annulate; principal internodes 1—5.5 cm. long; leaves decussate-opposite, numerous; petioles slender, abbreviated, 2—7 mm. long, densely hirsute with spreading white hairs, margined; leaf-blades chartaceous, usually thick-textured, rather uniformly dark-green on both surfaces or somewhat lighter beneath, often variegated with yellow, rarely entirely chlorotic, those at the tips of the branches smaller, 1.3—8.3 cm. long, 1—5.8 cm. wide, acute at the apex, usually truncate or subtruncate at the base or cuneately narrowed into the petiole, irregularly incised-dentate from the apex to the base with numerous acute and spreading, often lobe-like and doubly dentate teeth, more or less densely soft-pubescent or hirsutulous on both surfaces with rather coarse whitish hairs which are antrorsely strigose above and usually spreading from the midrib and larger veins beneath; inflorescence terminal, large and showy, varying from an extremely flat corymb to a very long spike, the floriferous portion 4.5—6.5 cm. long, 5.5—9 cm. wide, 28—55-flowered; peduncles tetragonal, 3—10 or more cm. long, densely white-hirsute or -villous like the branches; spikes at first depressed and corymb- or fascicle-like, later elongating, very densely many-flowered, the flowers closely imbricate and often more or less fragrant; bractlets lanceolate, much shorter than the calyx, 5—6 mm. long, attenuate at the apex, densely soft-pubescent with whitish hairs; calyx tubular, 0.8—1.5 cm. long, 5-costate and -plicate, densely white-hirsutulous, its rim varying from subtruncate and merely undulate to very shortly 5-apiculate; corolla hypocrateriform, very large and showy, varying from white or cream-color to practically all shades of pink, rose, red, crimson, scarlet, yellow, maroon, light-vermillion, deep-blue, or purple, some forms described as "between prune purple and fluorite purple", "light carmine varying to spectrum red toward the margins", "Eugenia red with lighter areas toward the center of Begonia red", "rose-red", or "Dahlia purple to Schoenfield's purple in age", usually with a white, cream, or yellow "eye-spot" of varying diameter in the center of the limb and with or without a colored inner rim, sometimes with pink or red and white stripes, the tube 1.5—3 cm. long, usually greenish or whitish, glabrous or obscurely pilosulous on the outside, the limb 1—2.5 cm. wide, the young flowers often with a small white "eye" which is absent from or not so noticeable on older flowers; anthers not appendaged; pollen often 38—78 percent aborted; developed pollen-grains 47—87 μ in diameter; chromosome number: x = 5; 2n = 10—20.

This is an extremely polymorphic hybrid, and is planted for ornament practically throughout the civilized world. It often tends to escape from or persist after cultivation in warmer areas. The exact ancestry of the plant is not certain, but it is supposed to be a multiple hybrid between *V. platensis* Spreng., *V. phlogiflora* Cham., *V. incisa* Hook., and *V. peruviana* (L.) Britton, all native to South America. The first-named "parent" is apparently the source of the white corollas seen in such varieties (cultivars) as *alba* and *candidissima* mentioned in the extensive synonymy above and the fragrance characteristic of most varieties. The second-named "parent" apparently brings in the rosy and purple shades seen in the varieties *caerulea*, *rosea*, *nigro-violacea*, and *purpurea*. The last two, names *V. incisa* and *V. peruviana*, are undoubtedly the source of the red colors in var. *coccinea*, as well as the general leaf-shape and procumbent habit of the plant. Collectors, on their collection labels, have used the following adjectives in describing the corollas: pale-pink, rose, bright red, vivid red, bright scarlet, scarlet-magenta, rose-pink, cherry-red, deep pink, bright orange-red, blue-purple, dark purple, dark blue-purple, rose-violet, lilac-blue, or "white with a faint pink tinge".

Hegi (1927) asserts categorically that this plant is a hybrid between only *V. phlogiflora* and what he calls *V. chamaedryfolia*. He lists the "Verbena Défiance" and "scharlach-Verbene", as well as "Nordlicht Verbene", as being the results of this cross. Then he lists the "aurikel-blütigen Verbenen" and "geäugte Verbenen" as having originated from *V. phlogiflora* crossed with what he calls *V. teucrioides*.

It should be noted here that *V. hybrida* Bicknell is x*V. engelmannii* Moldenke, *V. coccinea* Waterer is *V. peruviana* (L.) Britton, *V. striata* Vent. is *V. stricta* Vent., *V. grandiflora* Ort. is *Priva grandiflora* (Ort.) Moldenke, *V. grandiflora* Sessé & Moc. is *V. amoena* Paxt., and the *V. grandiflora* of Michaux and of Steudel are *V. canadensis* (L.) Britton. The recently produced hybrid between x*V. hybrida* Voss and *V. tenuisecta* Briq. is x*V. teasii* Moldenke, which see.

There are apparently at least five names proposed for this cultivated plant which are earlier than the one of Voss here adopted, but x*V. hybrida* seems to be the first actually proposed in the correct taxonomic category (*i.e.*, as a hybrid) and therefore, if my understanding of the present edition of the International Rules of Botanic Nomenclature is correct, is the one that must be adopted. The earlier names seem to have been proposed as species, subspecies, or varieties, not as hybrids.

x*Verbena hybrida* has been collected in anthesis from January to May and from July to December, growing at altitudes from sea-level to 2600 meters, the latter in Colombia. Herbarium material has been misidentified and distributed under the following names: *V. aubletia* Jacq., *V. chamaedrifolia* Juss., *V. chamaedrifolia* L., *V. chamaedryfolia* Juss., *V. incisa* Hook., *V. marrubioides* Cham., *V. peruviana* L., *V. peruviana* (L.) Britton, *V. phlogiflora* Cham., *V. phlogiflora* Cham. & Schlecht., *V. platensis* Spreng., *V. supina*

L., *V. teneroides* Gill. & Arn., *V. teucrioides* Gill. & Hook., *V. teucroides* Gill., and *V. venosa* Gill. & Hook.

The type of the *V. hybrida* var. *variegata* mentioned in the synonymy above is *Herb. Hort. Bot. Bogor. XV.K.A.XLV.12* in the Buitenzorg Herbarium, while that of *V. lindleyi* is *Herb. Hort. Bot. Calcutt. s.n.* in the same herbarium. The type of *V. voglioni* is *Herb. Hort. Bot. Basil. s.n.* [Aug. 1841] in the Meisner Herbarium at the New York Botanical Garden, inscribed "videtur hybrida e *V. teucrioides* et *V. venosa*?" The type of *V. anaïs* is another sheet of *Herb. Bot. Basil. s.n.* [Aug. 1841] in the Meisner Herbarium, but inscribed "Hybrida inter *V. teucrioides* et *V.* Tweedianam."

It is my opinion that polymorphic garden plants, or cultigens, like this one, should be given a single scientific binomial name (*e.g.*, x*Vitis labruscana*, x*Chrysanthemum morifolium*, x*Gladiolus hortulanus*, x*Delphinium cultorum*, x*Verbena hybrida*, etc.) for use in herbaria where preserved material needs to be classified and filed. If it is desired further to divide this taxon, the following varietal and form designations will serve to cover all the 125 or more horticulturally named trade varieties (cultivars): var. *compacta* Wittmack, of compact growth; f. *nana* Beale, of dwarf stature; var. *auriculiflora* Vilm., with a conspicuous central "eye" even on old flowers; var. *striata* Vilm., with striped corolla-lobes; var. *grandiflora* Haage & Schmidt, especially large-flowered; var. *alba* Thompson & Morgan, with white corollas; var. *caerulea* Thompson & Morgan, with blue corollas; var. *coccinea* Haage & Schmidt, with scarlet or red corollas; var. *lutea* Haage & Schmidt, with yellow or yellowish corollas; var. *nigro-violacea* Haage & Schmidt, with violet or dark-violet corollas; var. *purpurea* Thompson & Morgan, with purple corollas; and var. *rosea* Thompson & Morgan, with pink or rose-colored corollas.

Horticulturists wishing to use trade names will find the following list of value. Descriptions of the plant, as given by the tradesmen, follow the name, as well as a list of the dealers who are said to handle that variety. In a few cases the descriptions given by various dealers for what is purportedly the same variety differ so much that I have given them under a separate entry. The principal dealers referred to are: Bodger Seeds, El Monte, California; Buchman's, Minneapolis, Minnesota; Burnett Brothers, New York City, New York; Burpee Seeds, Doylestown, Pennsylvania; Carter's Tested Seeds, London, England; D. M. Ferry & Company, Detroit, Michigan; Haage & Schmidt, Erfurt, Germany; Harrison, Maidstone, England; Peter Henderson & Company, New York City, New York; Herbst Brothers, New York City, New York; Hurst & Son, London, England; Norsk Fro, Oslo, Norway; Pearce, Moorestown, New Jersey; Perkins Brothers Garden Center, Saint Paul, Minnesota; Roberts, Davington, Kent, England; Saier, Dimondale, Michigan; J.

Steckler Seed Company, New Orleans, Louisiana; Stumpp & Walter Seeds, New York City, New York; Sutton & Sons, Reading, England; John Swain, Bristol, England; Terrace Gardens, Youngstown, Ohio; Otis S. Twilley, Salisbury, Maryland; Vaughan's Seed Company, Chicago, Illinois, and New York City, New York; Vilmorin-Andrieux & Cie, Paris, France; Waller-Franklin Seed Company, Guadalupe, California; and Watkins & Simpson, Drury Lane, London, England.

Alba (Haage & Schmidt) — rein weiss; blanc pur.

Annapolis (Michell; Stumpp & Walter) -- a strong husky grower with large trusses of 3-inch flowers, 12 inches tall, the first mid-blue in Verbena without any tendency to have a purple cast to the corollas, a real deep Belladonna-blue.

Annapolis Blue (Burnett; Vaughan's) — see "Annapolis".

Apple Blossom (Burpee; Kennedy) — robust, spreading, 8—12 inches tall, 2 1/2 feet or more wide, the flowers over 1 inch wide, almost white, shading to delicate cameo-pink toward the edges.

Atroviolacea (Haage & Schmidt) — rein dunkelviolett; violet foncé pur.

Auricula (Park) -- in many colors, the corollas with a large distinct "eye".

Basilisk -- clear pink, with a white "eye".

Beauty of Oxford (Buchman's; Burnett; Hasting's Seeds; Paul J. Howard's California Flowerland; Vaughan's; Waller-Franklin) — spreading, 12 inches tall, flowers 3/4 inch wide, rich rosy-salmon, variable in shade.

Beauty of Oxford Hybrids (Breck; Henderson; Kennedy; Michell; Stumpp & Walter) — 18 inches tall, flowers over 1 inch wide, rose-pink to rose-red, the brightest rose verbena ever produced from seed, a cross between Beauty of Oxford and Luminosa.

Beethoven -- rich scarlet.

Blue Defiance (W. H. Simpson) — spreading, 14 inches tall, the flowers 3/4 inch wide, rich violet-blue, variable in shade, with a large creamy-white "eye". This is identical with the Grandiflora Blue of Waller-Franklin.

Blue Peter (Demarest) — rich blue, with a white "eye".

Blue Sentinel (Burpee; Michell) — 10 inches tall, flowers in broad deep trusses, rich violet-blue or royal violet-blue; All-America Bronze Medal Winner.

Blue Shades (Waller-Franklin) — spreading, 16 inches tall, flowers 1/2 inch wide, violet-blue, variable in shade. Apparently the same as the Dark Blue of Bodger.

Blue White-eye (Bodger; Macdonald) — spreading, 18 inches tall, flowers 1/2 inch wide, violet-blue, very variable in shade, with a large creamy-white "eye".

Brilliant (Guldemand's Seeds; Henderson; Kennedy; Toogood & Sons)

— 6 inches tall, flowers deep rich flame-rose, with a medium-sized white "eye".

Brilliant Giant (Michell) — flowers rich deep flame-rose, with medium-sized white "eye". Apparently the same as "Brilliant".

Bush or Multiflora (Putz) — tall but with a spread of only 15 inches, concentrating the flowers in a smaller arc and heightening the effect. Apparently the same as "Bush Type".

Bush Type (Park) — broad flattopped bushy plants, 8—10 inches tall, 12--15 inches across, the flower-heads almost touching each other and covering the entire plant.

Bush Type Mixed (Park; Vaughan's) — with uniform broad-topped bushy habit, 8—10 inches tall, 12—15 inches across, the flower-heads practically touching each other, the flowers vivid-red, salmon-pink, mid-blue with a white "eye", and clearest white.

Calypso (Park) — flowers boldly candy-striped in sharply contrasting colors: white striped with flashing red, lavender on purple, light-pink on deep-rose, and pink on white.

Cameo Pink (Bodger) — compact, prostrate, to 6 inches tall, the flowers 7/10 inch wide, soft blush-pink.

Candidissima (Haage & Schmidt) -- sehr grossblumig, reinstes weiss; blanc pur, à grandes fleurs.

Cardinal (Bodger) — spreading, 16 inches tall, flowers 5/8 inch wide, rich scarlet, with a small creamy-white "eye"; a variable stock.

Carmine Ball (Bodger; Burpee; Michell; Waller-Franklin; Watkins & Simpson) — very compact, 9 inches tall, the flowers 1/2 inch wide, bright- or deep-carmine, variable in shade, with a white "eye".

Carmine Rose (Bodger) — spreading, the flowers rosy-carmine and cerise, a mixed stock.

Carter's Dwarf Coerulea — deep-blue or dark blue-purple flowers.

Carter's Dwarf Compact — purple flowers.

Carter's Holborn Mammoth -- pink flowers.

Century (Henderson) -- flowers brilliant scarlet, with a clear white center.

Cerise Queen (Waller-Franklin; Burnett; Guldemand's Seeds; Watkins & Simpson) — spreading, 12 inches tall, the flowers 3/4 inch wide, rich rosy-cerise, with a small creamy-white "eye"; a stock with color rogues.

Cerise Queen (Kennedy) — long stems, with immense individual flowers over 1 inch wide on giant trusses, soft salmon-cerise.

Chamois (Bodger) — compact, 16 inches tall, the flowers 2/5 inch wide, not opening completely, soft salmon-buff, a true even stock.

Coccinea (Waller-Franklin) — spreading, 16 inches tall, the flowers 5/8 inch wide, dull scarlet, with a small creamy-white "eye".

Coccinea (Bodger) — spreading, more dwarf, 12 inches tall, the flowers 3/4 inch wide, bright scarlet.

Coccinea (Haage & Schmidt) — rein scharlach; écarlate pur.

Coccinea oculata (Haage & Schmidt) — rein scharlach mit weissem Auge; écarlate pur à oeil blanc.

Coerulea (Haage & Schmidt) — rein dunkelblau; bleu foncé pur.

Coerulea oculata (Haage & Schmidt) — dunkelblau mit weissem Auge; bleu foncé à oeil blanc.

Colossea (Park) — flowers over 1 inch wide, in large umbels, in lovely pink shades, also rose with a white "eye".

Creamy White (Burpee) — dwarf, compact, 6 inches tall, 10—12 inches wide, forming neat little mounds covered with medium-sized flower-heads, the flowers creamy white.

Crimson Glow (Burpee; Michell; Stumpp & Walter; Vaughan's) — robust, spreading growth, flowers over an inch wide, forming a solid mass of rich showy color of the finest deepest red or a rich glowing crimson, without a white "eye".

Crimson Seedling (Bodger) — spreading, 12 inches tall, the flowers 3/4 inch wide, deep ruby-crimson.

Crown Prince (Bodger) — compact, 10 inches tall, the flowers 3/8 inch wide, deep chestnut-crimson, with a small creamy-white "eye", a good even stock.

Crystal (Breck; Henderson; Herbst; Park; Saier; Terrace Gardens; Vaughan's) — dwarf compact habit, 9 inches tall, spreading only 10—12 inches, with 10—15 flower-stems per plant, the flowers pale glistening snowy-white in immense trusses, immaculate.

Cupreata (Haage & Schmidt) — kupferscharlach; écarlate cuivré.

Damson (Henderson) — flowers rich purple-mauve, with a clear white center.

Dannebrog (Bodger; Daehnfeldt; Watkins & Simpson) — less compact, 12 inches tall, the flowers 1/2 inch wide, rosy-crimson, with a creamy-white "eye", the stock variable in habit and flower shade.

Dark Blue (Bodger; Hurst) — spreading, 16 inches tall, the flowers 1/2 inch wide, violet-blue, variable in shade. Apparently the same as the Blue Shades of Waller-Franklin.

Dazzle (Park; Vaughan's) — dwarf compact habit, flowers solid scarlet-red, with no "eye", "so bright you need sunglasses to look at it!"

Defiance [Défiance] (Hurst; Vaughan's; Waller-Franklin) — spreading, 12 inches tall, the flowers 1/2 inch wide, rich scarlet, with a small creamy-white "eye". This is the Défiance of Haage & Schmidt.

Defiance Re-selected (Watkins & Simpson) — apparently the same as the Defiance of Waller-Franklin.

Défiance (Haage & Schmidt) — feurig scharlach. This is the same as the Defiance of Waller-Franklin.

Défiance purpurea (Haage & Schmidt) — purpurroth.

Delight (Park; Vaughan's) — see Dwarf Delight.

Deutscher Kronprinz (Haage & Schmidt) — listed as a form of Verbena hybrida compacta erecta.

Dwarf (Putz; Vaughan's) — see Sparkle.

Dwarf Delight (Vaughan's) -- 6—7 inches tall, the flowers clear coral-pink, suffused with salmon.

Dwarf Master Blend (Vaughan's) — very compact and dwarf, the flowers appearing when the plants are very small, retaining their color and habit throughout the season, with a wide range of color, many with "eyes".

Dwarf Mixed (McAllister) -- spreading to form circular bushes about 24 inches in diameter, compact, the stems stiff and erect, the flowers large and varicolored.

Dwarf White Compact (McAllister) — short sturdy habit, very bushy, the stems about 6 inches long, flowers white.

Edith (Henderson) — flowers salmon, shaded carmine, with a white center.

Elfin Scarlet (Bodger; Macdonald; Ryder; Waller-Franklin) — compact, the flowers red, various in shade, with color rogues.

Elite (Ohlsens Enke) — spreading, 16 inches tall, the flowers 5/8 inch wide, mixed colors.

Ellen Willmott (Bodger; Hurst & Son; John Swain; Thompson & Morgan; Watkins & Simpson) — spreading, 12 inches tall, the flowers 5/8 inch wide, rich rosy salmon-pink, with a small creamy-white "eye", a true stock, but germination bad.

El Mahdi (Demarest) — flowers royal-purple.

Emily (Henderson) — flowers royal-purple, with a clear large white center.

Emily Dale (Demarest) — flowers beautiful pink.

Etna (Michell; Waller-Franklin) — spreading, 12 inches tall, the flowers 3/4 inch wide, rich scarlet or intense geranium-red, with a small creamy-white "eye".

Etna (Kelway; Macdonald; Watkins & Simpson) — inferior stocks of the above.

Etna (Stumpp & Walter) — flowers vivid scarlet, with a small yellow "eye".

Fairy Queen (Bodger) -- compact, a mixed stock.

Fanny (Henderson) — flowers violet-rose, with a large white "eye".

Fine Mixed (Ferry) — various in color, shades, and striping, usually running from pure white to deep-purple.

Finest Mixed (Burpee) — a mixture of Apple Blossom, Crimson Glow, Floradale Beauty, Lavender Glory, Royale, Salmon Pink, Spectrum Red, and White.

Fireball (Kelway; Watkins & Simpson) — compact, 10 inches tall, the flowers 3/4 inch wide, bright rosy-red, a good even stock.

Fireball (Burpee; Stumpp & Walter) -- 6 inches tall, covered with brilliant scarlet or flame-scarlet flowers.

Firefly — bright scarlet.

Firelight (Henderson; Park; Stumpp & Walter; Vaughan's) — 10 inches tall, broadly flat-topped, bushy, the flowers a most vivid rich scarlet, intensified by the absence of an "eye".

Flamingo (Stumpp & Walter) — erect, 1 1/2 feet tall, the flowers vermillion-pink.

Floradale Beauty (Burnett; Burpee; Kennedy; Norsk Fro; Saier) — robust spreading growth, the flowers over an inch wide, Beauty of Oxford type, in extra large trusses, in shades of rose from bright rose-pink to deepest rose-red, with salmon-rose predominating; All-America Silver Medal Winner.

Galatea (Henderson) -- flowers bright scarlet, evenly striped with white.

Giant (Burpee) — 12 inches tall, with a wide range of colors.

Giant Erect Mixed (W. H. Simpson) -- compact, 18 inches tall, the flowers 1/2 inch wide, in mixed colors.

Giant Salmon Pink (Vaughan's; Waller-Franklin) — spreading, 14 inches tall, with flowers 5/8 inch wide, rich rosy-salmon with a small creamy-white "eye", a good even stock.

Gigantea Alba (Guldemand's Seeds; Garden Trails Nursery; Husbands Rockcliffe Gardens; La Germinadora; Vaughan's) -- robust habit, 12 inches tall, with flowers 1 inch wide, pure white, very fragrant.

Gigantea Annapolis Blue — see "Annapolis".

Gigantea Beauty of Oxford — see "Beauty of Oxford".

Gigantea Brilliant -- see "Brilliant".

Gigantea Ellen Willmott — see "Ellen Willmott".

Gigantea Giant Salmon Pink — see "Giant Salmon Pink".

Gigantea Lavender Glory -- see "Lavender Glory".

Gigantea Lucifer — see "Lucifer".

Gigantea Rose Queen -- see "Rose Queen".

Gigantea Royale -- see "Royale".

Gigantea Scarlet Queen -- see "Scarlet Queen".

Gigantea Snow Queen — see "Snow Queen".

Gigantea Vivid — see "Vivid".

Glow-worm (Henderson) — flowers brilliant scarlet, of perfect form.

Golden Queen (Bodger; Kelway; Park; Pfitzer) — spreading, 15 inches tall, with flowers 3/8 inch wide, golden- or sulphur-yellow. Probably identical with the Lutea Improved of Waller-Franklin.

Grandiflora (Park) -- 1 foot tall, with vigorous spreading growth suitable for groundcover, the flowers 3/4 inch wide, freely borne in ball-like clusters 3 inches wide.

Grandiflora Blue (Waller-Franklin) -- spreading, 14 inches tall, with flowers 3/4 inch wide, rich violet-blue, with a large creamy-white "eye", stocks rather variable. Probably the same as Blue Defiance of W. H. Simpson.

Grandiflora Etna (Park) -- flowers intense geranium-red, with a cream-yellow "eye", in large trusses.

Grandiflora White (Bodger) -- spreading, 18 inches tall, the flowers white, 3/4 inch wide, with color rogues. Probably identical with the Snow Queen of Harrison.

Grandiflora White (Waller-Franklin) -- spreading, 15 inches tall, the flowers 1/2 inch wide, white, with color rogues, but distinct from Bodger's stock.

Groszblumige Verbene -- see "New Mammoth Verbena".

Improved Helen Willmott (Michell) -- salmon flowers.

Jean (Henderson) -- flowers rosy-pink, with a distinct white center.

Lakme (Demerest) -- flowers crimson-scarlet.

Lapis Lazuli (Henderson) -- flowers blue, of perfect form.

Laurence Johnson (Winkfield Manor Nurseries) -- flowers deep crimson.

Lavender Glory (Kelway; Park; Waller-Franklin) -- spreading, 15 inches tall, the flowers 7/8 inch wide, soft lavender, with pink and white rogues.

Lavender Glory (Breck; Burnett; Burpee; Guldemand's Seeds; Henderson; Herbst; Hasting's Seeds; Paul J. Howard's California Flowerland; Hurst & Son; Michell; John Swain; Vaughan's) -- 6 inches tall, the flowers lavender to light-lavender, with a white or creamy-white "eye", large blooms, not entirely fixed (80 percent true), with still a few light colors as rogues, distinctly fragrant; All-America Silver Medal winner.

Lawrence Johnson -- see "Laurence Johnson".

Lucifer (Michell) -- flowers large, cardinal-red.

Lucifer (Bodger; Vaughan's; Waller-Franklin) -- spreading, 12 inches tall, the flowers 5/8 inch wide, deep rich scarlet.

Luminosa (Kennedy) -- the flowers 1 inch or more wide, flame-pink toning to soft salmon, flesh, and coral.

Luminosa (Bodger; Macdonald; Michell; Waller-Franklin) -- spreading 12 inches tall, the flowers 5/8 inch wide, rose-pink or flame-pink toning to softer shades of pink or coral, with a creamy-white "eye".

Lutea Improved (Waller-Franklin) -- spreading, 15 inches tall, the flowers 3/8 inch wide, sulphur-yellow.

Magenta Verbena Plant (Chandler) -- 18 inches tall, the flowers dahlia-purple to Schoenfeld's purple in age.

Majestic Rose Shades (Watkins & Simpson) — spreading, 16 inches tall, the flowers 5/8 inch wide, in rose and rose-pink shades.

Maltese (Henderson) — flowers lilac, shaded blue.

Mammoth Golden Queen (Kennedy) — the flowers clear golden-yellow, medium in size, vigorous in growth, one of the earliest to flower, continues to bloom until frost.

Mammoth Pink (Henderson) — 6 inches tall, the flowers pink.

Mammoth Mixed (Carter) -- spreading, 16 inches tall, the flowers 5/8 inch wide, mixed colors.

Mammoth Pink (Burpee) — 8—12 inches tall, the flowers vivid dazzling red.

Mammoth Purple (Henderson) — 6 inches tall, the flowers purple.

Mammoth Queen (Park) — 18 inches tall, with enormous flowers and flower-clusters.

Mammoth Scarlet (Henderson) — 6 inches tall, with scarlet flowers.

Mammoth White (Henderson) — 6 inches tall, with white flowers.

Mammuth (Haage & Schmidt) -- Mischung der grösstblumigen Varietäten, bringt einen guten Procentsatz echter Pflanzen. Apparently the same as *Verbena hybrida grandiflora*.

Manteau Pourpre (Haage & Schmidt) — same as Purpurmantel and Purple Cloak; identical with *Verbena hybrida purpurmantei*.

Marion (Henderson) — flowers mauve, with a white center, of perfect form.

Mayflower (Michell; Vaughan's) -- flowers light-pink.

May Queen (Demerest) — flowers soft magenta-pink.

Miniatures Types (Stumpp & Walter) -- 6—9 inches tall, mixed colors.

Miss Stout (Henderson) — flowers carmine-scarlet.

Miss Willmott (Park) — large-flowered, the flowers bright salmon-rose.

Mixed (Breck; Henderson; Stumpp & Walter) — an amazing flood of rich colors.

Mixed Giant-flowered (Stumpp & Walter) -- flowers large, all shades.

Mixed Miniature (Henderson; Stumpp & Walter) — 9 inches tall, blooming continuously in a wide range of colors.

Monogram (Demerest) — flowers blue, with a large white "eye".

Mrs. Massey (Henderson) — flowers salmon-pink, with a large white center.

Multiflora (Park) — new bush type.

Negro (Demerest) — flowers black.

Nelly Park (Henderson) -- flowers orange-scarlet.

New Mammoth (McAllister) -- flowers large, in brilliant colors, all shades from scarlet to white, with a large contrastingly colored "eye".

Newport Salmon (Michell) -- the flowers true salmon-pink, extra large, with a white "eye".

New Red (Hurst) — spreading, 14 inches tall, the flowers 5/8 inch wide, dull crimson, with a small creamy-white "eye".

New Royal Bouquet (Park) — upright, 18 inches tall, each plant a bouquet of many shades and variegations.

Nigro-violacea albo-oculata (Haage & Schmidt) — schwarzblau mit weissem Auge; bleu noirâtre à oeil blanc.

Pastel Shades (Michell) -- an exceptionally beautiful blend of new shades with very large flowers.

Pfitzer's Giant (Pfitzer) — spreading, 16 inches tall, the flowers 5/8 inch wide, mixed colors.

Pink and Rose Bouquet (Michell) — a choice blending of two popular colors.

Pink and Rose Shades (Waller-Franklin) — a darker flowered selection of Majestic Rose Shades.

Primrose (Blanc) — flowers yellow.

Pure White (Macdonald) — spreading, 9—12 inches tall, the flowers 1/2 inch wide, dull white, a true stock.

Purple Cloak (Park) — the flowers dark purple-red, with a white throat. Idantical with Purpurmantel and Manteau Pourpre.

Purple Verbena Plant (Chandler) -- 12 inches tall, the flowers between prune-purple and fluorite-purple.

Purpurmantel (Haage & Schmidt) — same as Purple Cloak, Manteau Pourpre, and _Verbena_ _hybrida_ _purpurmantei_.

Purpurviolett (Haage & Schmidt) — purpurviolett mit weisser Mitte; violet pourpre à centre blanc.

Rainbow — see "Rainbow Mixture".

Rainbow Mixture (Herbst; Putz; Roberts; Twilley) -- more compact and upright, not over 8 inches high.

Red Sentinel (Michell) -- a true dwarf compact variety, 6—8 inches tall when mature, retaining its upright and compact habit throughout the entire blooming season, the flowers intense bright-red, with no "eye", 12—15 clusters per plant.

Red Verbena Plant (Chandler) — 12 inches tall, the flowers light-carmine, merging into spectrum red toward the margin.

Rose and Carmine (Park) — many pretty shades mixed.

Rosea Stellata (Bodger; Waller-Franklin) — spreading, the flowers pink, variable stock.

Rose Cardinal (Bodger; Waller-Franklin) — spreading, 16 inches tall, the flowers 5/8 inch wide, rich rosy-red, with a large creamy-white "eye".

Roseglow (Michell) -- the flowers deep glowing rose shading to orange-scarlet, so luminous that each plant has the appearance of a small flat fountain of fire, decidedly free-flowering, with an average of 40 clusters per plant when in full bloom.

Roselight (Henderson; Park; Stumpp & Walter; Terrace Gardens; Vaughan's) -- 10 inches tall, broadly flat-topped, bushy, 12--15 inches across, the flowers rose or rose-pink, with a white "eye".

Rose Queen (Hurst; Park; Thompson & Morgan; Unwin; Watkins & Simpson) -- the flowers a charming soft rose.

Rose Red Verbena Plant (Chandler) -- 15--16 inches tall, the flowers rose-red.

Rose Verbena Plant (Chandler) -- 13 inches tall, the flowers Eugenia red, with lighter areas toward the center of Begonia rose.

Royal Bouquet (Bodger; Buchman's; Pearce; Putz; Thompson & Morgan; Waller-Franklin; Watkins & Simpson) -- compact, upright, 18 inches tall, the flowers 1/2 inch wide, mixed colors. The same as Giant Erect Mixed of W. H. Simpson.

Royal Bouquet Mixed (Burpee; Michell) -- upright and compact, 15-18 inches tall, with large erect flowers in brilliant colors.

Royale (Henderson; Stumpp & Walter) -- 6 inches tall, the flowers royal blue, with a primrose-yellow "eye". Probably the same as Royale Blue.

Royale (Kennedy) -- the flowers deep-purple with a large white "eye".

Royale (Waller-Franklin; Watkins & Simpson) -- spreading, 12 inches tall, the flower 3/4 inch wide, deep violet-purple, with a large creamy-white "eye", a good even stock.

Royale (Breck; Burpee; Garden Trails Nursery; Guldemand's Seeds; Herbst; Hurst; Michell; Thompson & Morgan; Unwin; Vaughan's; Watkins & Simpson) -- the flowers of enormous size, rich deep royal blue, with a creamy-yellow "eye".

Royale (Bodger; Harrison; Kelway; Waller-Franklin) -- variable stocks of Michell's.

Royale Blue (Burnett; Hasting's Seeds; Paul J. Howard's California Flowerland) -- Probably the same as the Royale of Breck and Henderson.

Royalty (Park) -- the flowers of vivid blue shades, showy in beds.

Salmon Defiance (W. H. Simpson) -- spreading, 16 inches tall, the flowers 3/4 inch wide, pale rose-pink, with a creamy-white "eye", with color rogues.

Salmon King (Breck; Burnett; Garden Trails Nursery; Herbst; Vaughan's) -- the flowers rich deep salmon.

Salmon Pink (Bodger) -- spreading, 12 inches tall, the flowers 5/8 inch wide, pale rose-pink, with color rogues.

Salmon Pink (Burpee; Stumpp & Walter) -- of robust spreading growth, the flowers over an inch wide, true salmon-pink, even tone.

Salmon Queen (Kennedy; Park; Stumpp & Walter; Vaughan's) -- 8--10 inches tall, broadly flat-topped, bushy, 12--15 inches across, the flower-clusters practically touching each other, the flowers a most pleasant shade of bright salmon or bright salmon-pink, with a small cream "eye".

Salmon Queen (Park) -- the flowers bright salmon or salmon-rose, with a white or cream "eye".

Scarlet Bedder (Demerest) -- flowers brilliant scarlet, with a white "eye".

Scarlet Defiance (W. H. Simpson) -- spreading, 18 inches tall, the flowers 5/8 inch wide, scarlet, with a large creamy-white "eye", a true stock.

Scarlet King (Michell) -- the flowers bright-red.

Scarlet Queen (Hurst; Park; Thompson & Morgan; Unwin; Watkins & Simpson) -- the flowers huge, vivid-scarlet, with a white "eye".

Scharlachrosa (Wittmack) -- auffallend schöne, niedrige Verbena von aufrechten Wachstum; die zahlreichen, an straff aufgerichteten Stielen sitzenden Blumen sind von leuchtend scharlachrose Farbe mit weissen Auge".

Schlosser's Pride (Michell) -- the flowers dark-red.

Sedan (Demerest) -- the flowers blood-red.

Silver Plume (Demerest) -- the flowers finest white.

Simoon (Demerest) -- the flowers brilliant crimson, with a dark "eye".

Snowball (Bodger) -- compact, 15 inches tall, the flowers 5/8 inch wide, dull white.

Snowdrift (Breck) -- flowers purest white.

Snow Queen (Harrison) -- spreading, 18 inches tall, the flowers 3/4 inch wide, white, with color rogues. The same as Grandiflora White of Bodger.

Snow Queen (Hurst; Park; John Swain; Thompson & Morgan; Watkins & Simpson) -- giant-flowered, the flowers a lovely pure white.

Snow White -- see "Snow-white".

Snow-white (Burnett; Henderson; Park; Stumpp & Walter; Vaughan's) -- 10 inches tall, broadly flat-topped, bushy, 12--15 inches across, giant-flowered, the flowers pure white.

Sparkle (Breck; Buchman's; Herbst; Park; Perkins; Saier; Terrace Gardens; Vaughan's) -- dwarf, of uniform compact growth, 7 inches tall, the flowers brilliant scarlet or bright scarlet-red, with a large gleaming white "eye".

Sparkle (Putz) — only 10 inches tall, so densely covered with flowers that only an occasional leaf shows through.

Sparkle Mixed (Park) — 10 inches tall, dwarf compact mound-shaped plants, free-flowering, completely covered with blooms, no open spots; colors are warm scarlet through rose and pink to softer salmon, lavender and white, mid-blue and purple, many with bright-hued combinations. This is probably the Sparke of Putz.

Special (Burpee) — a mixture of Apple Blossom, Royale, Spectrum Red, and White.

Spectrum Red (Breck; Burnett; George Delbard; Guldemand's Seeds; Herbst; Norsk Fro; Park; John Swain; Vaughan's; Waller-Franklin) — spreading, 12 inches tall, the flowers 3/4 inch wide, brilliant scarlet or intense rich scarlet, with no "eye".

Spectrum Red (Watkins & Simpson) — a less regular stock of the above.

Spectrum Red (Henderson; Stumpp & Walter) — 6 inches tall, the flowers a dazzling spectrum red.

Splendor (Park; Vaughan's) — dwarf compact habit, the flowers rich royal-purple, accented by a clear snowy-white "eye".

Starlight (Henderson; Kennedy; Park; Stumpp & Walter; Vaughan's) — 8—10 inches tall, broadly flat-topped, bushy, 12—15 inches across, the flowers intense blue or bright mid-blue, with a creamy-white "eye".

Steckler D — flowers white.

Steckler E — flowers pink, with a white "eye".

Striata (Park) — flowers of red and rose shades, charmingly striped.

Striata (Haage & Schmidt) — italienische gestreifte in allen Farben gemischt; striés en mélange.

Sutton's Blue (Burpee; Herbst; Norsk Fro; Park; Sutton) — the flowers deep royal-blue or solid mid-blue, in rounded trusses 2 1/2 to 3 inches long and wide.

Union (Henderson) — flowers with an enormous white eye encircled by a rim of violet-blue.

Venus (Burpee) — dwarf, erect, 10 inches tall, the flowers soft chamois-pink, the innermost ones suffused with copper.

Violacea Stellata (Bodger; Kennedy) — spreading, the flowers violet or deep-violet, with a white "eye", a mixed stock.

Violet Bouquet (Waller-Franklin) — compact, 12 inches tall, the flowers 3/4 inch wide, bright reddish-violet, with a creamy-white "eye".

Vivid (Garden Trails Nursery; Vaughan's) — the flowers most brilliant sunproof scarlet, a bright intense color, in large uniform trusses growing close together, forming a solid carpet 8 inches tall, the flowers proportionately large.

Weisze Zwerg-verbene — see "Dwarf White Compact".

White (Burpee) -- flowers white.

White Ball (Michell) -- petite, 7 inches tall, with 20 or more stiff erect branches, each with 3—5 clusters of 2-inch pure white flowers.

White Beauty (Henderson) — 6 inches tall, the largest and finest pure-white variety ever introduced, the flowers pure-white, blooming continuously.

White King (Stumpp & Walter) — flowers pure sparkling white.

Zwerg Verbenen — see "Dwarf Mixed".

In addition to the above, the following horticultural names have also been found in the trade: All-color Giant, American Beauty, Anna Gérard, aurikel-blütigen Verbenen, Beacon Light, Belle Alliance, Blue Queen, Blue Triumph (Husband's Rockcliffe Gardens), Brightness (Burnett), British Queen, Burnett's Scarlet, Cerise Beauty of Oxford, Choice Mixed, Coccinea Dwarfer, Complete Mixture, Danneborg [error for Dannebrog], Dwarf Coerulea, Dwarf Compact, Dwarf Violet Bouquet, Dwarf White, Elegance, Exquisite, Ferry, Flame (Perkins), Fordhook Famous, Fragrance, gestugte Verbenen, Giant Auricula-flowered, Giant Pink, Gigantea, Gigantea Monstrosa (Toogood & Sons; Watkins & Simpson), Gigantea Purple Glory (John Swain), Gigantea Rosea Stellata (Guldemand's Seeds), Gigantea Sutton's Pink (Guldemand's Seeds: Sutton), Gigantea Violacea Stellata (Guldemand's Seeds), Holborn Mammoth, Hortensis (Norsk Fro), Hortensis Hybrida Grandiflora (Saier), Hybride Compacte Variée, Improved Mammoth, Johnson's Gigantea Mixed, Lavender Beauty of Oxford, Lavender Queen (Unwin), Magenta, Mamath, Mammoth, Mammoth Fancy Blue Shades, Mammoth Fancy Mixed, Mammoth Fancy Pink Shades, Mammoth Fancy Pure White, Mammoth Fancy Purple Mantle, Mammoth Fancy Scarlet Shades, Mammoth Fancy Strain, Mammoth Rose Queen, Mammoth Scarlet Queen, Mammoth Snow Queen, Marilyn (Burnett; Terrace Gardens; Vaughan's), Master Blend (Buchman's; Terrace Gardens), Miss Millmott [error for Miss Willmott], Mühlbach, New Giant Flowered, New Mammoth, New Red, Nordlicht, Oxford Pink, Perlenspiel, Pink, Pink Beauty of Oxford, Pink-Delight, Pixie, Pluto, Purple, Purple Garnet, Purple King, Purple Mantle, Red, Red Emperor, Rose, Rose-red, Royal Blue, Scarlet, Scarlet Beauty of Oxford, Scharlach, Schlosser's Cerise-rose, Schlosser's Orchid, Shylock, Snowstorm, Spectrum, Sultane, Sutton's Giant Pink, Sutton's Giant Royal Blue, Sutton's Giant White, Tom Thumb, Triumphator, White-eye Blue, White Giant (Hasting's Seeds; Herbst), and Zeuxes. Unfortunately, I as yet lack any descriptions of these.

Popular names for *xV. hybrida* are also numerous, including "alfombrilla", "aurikelblumige Verbenen", "barbînâ", "camaradinha", "common garden verbena", "common verbena", "corbeille fleurie", "estradeira", "Eisenkraut", "garden verbena", "garden-vervains", "Garten-Verbene", "Gartenverbenen", "germanderblüssiga verbena", "germanderblüssiga verbene", "germanderblüttiga verbena", "garten Eisenkraut", "güvercin otu", "güverein otu", "hardy verbena", "lipia", "malvira", "margarita", "shah's favourite", "shapassan", "verbeina", "verbena", "verbêna", "verbena comune", "verbena de jardin", "verbena ibrida", "verveine", "verveine anais", "verveine commune", "verveines des jardins", "verveines hybrides" and "verveine hydride à fleur d'auricule". Bedevian (1936) gives two Armenian common names for the plant in Armenian script.

Bailey (1935) lists the following Latin-named varieties, with the florists or seedsmen handling the seeds of each at that time: *V. grandiflora* (Michell; Rose Valley, Lyon, New York; Schling); *V. hybrida* (Hunt; Muller-Seely; Stecklers; Littlefield-Wyman, North Abington, Massachusetts; Oscar H. Wills Company, Bismark, North Dakota); *V. hybrida alba* (Thompson & Morgan); *V. hybrida caerulea* (Haage & Schmidt; Thompson & Morgan); *V. hybrida candidissima* (Haage & Schmidt); *V. hybrida coccinea* (Haage & Schmidt); *V. hybrida compacta* (Haage & Schmidt); *V. hybrida grandiflora* (Haage & Schmidt; Huntington; Francis C. Stokes, Philadelphia, Pennsylvania); *V. hybrida lutea* (Haage & Schmidt); *V. hybrida nigro-violacea* (Haage & Schmidt); *V. hybrida purpurea* (Thompson & Morgan); *V. hybrida purpurmantei* (Haage & Schmidt); *V. hybrida rosea* (Thompson & Morgan); *V. hybrida striata* (Haage & Schmidt); *V. luminosa* (Chester J. Hunt; Waterer); *V. rosea stellata* (Huntington; Waterer; Kunderd Nursery, Goshen, Indiana); *V. violacea stellata* (Kunderd; Waterer).

In regard to Lemaire's *V. teucrioides* var. *anaïs*, the comments of the author are of interest: "Parmi les nombreuses variétés ou hybrides que l'on a obtenus de la *Verbena teucrioides*, il en est peu qui égalent celle-ci en neauté. Elle a été obtenue de semences par M. Chauvière, et nous lui avons imposé le nom de l'épouse de ce zélé commerçant, nous conforment en cela a l'usage général de donner des nomes l'hommes ou de femmes, de personnages célèbres, de dieux de la fable, etc., etc., à ces milliers de variétés de toute espèce que l'art a su créer dans les jardins. Mais, en cette occasion, nous nous sommes conformé au sentiment de M. Paxton, qui, décrivant de son côté une belle espèce de *Verbena* (*V. amoena*; Voyez Hortic. univ., ci-dessus, l. c.), blâme avec raison ces innombrables faiseurs de variétés, qui, le plus souvent par cupidité, quelquefois par ignorance, appliquent à tort et à travers des noms à des plantes obscures, bien loin souvent d'égaler le mérite du type qui leur a donné naissance. Cet abus devrait être frappé d'une réprobation générale, en ce que, dans cette occurrence, l'acheteur, trompé, a le droit d'accuser le vendeur de délotauté. Pour nous, quant à la plante dont il s'agit, nous ne craignons pas qu'on nous applique le blâme que nous signalons. Il suffira de jeter un regard sur la belle figure ci-contre pour reconnaître qu'il y a entre le type et la variété figurée une différence réelle que nous signalerons tout à l'heure, et tout à l'avantage de la dernière."......"Voilá en peu de mots l'historique et la description du type de la variété dont il s'agit. Celle-ci em diffère par ses feuilles manifestement petiolées (et qui nous feraient croire que l'hybridisation a presidé à sa création, c'est-a-dire qu'elle serait née d'une *V. teucrioides* et d'une espece congénère fort voisine), souvent lobées et même panduriformes; par son port plus élancé; par ses fleurs d'un rose, qui pâlit lors de l'épanouissement total, etc. C'est une belle plante, dont la floraison dure plus de deux mois, et qui, plantée en terreau de bruyères pur, prospere dans un endroit chaud et bien éclairé de la serre tempérée."

Rümpler (1873) discussed this plant as follows: "Einjährig, im Gewächshause ausdauernd. -- Es ist heutigen Tages sehr schwer, mit Sicherheit zu ermitteln, welchen botanischen Arten die unzähligen ausgezeichneten hybriden Verbenen unserer Gärten enstammen. Man wird jedoch mit der Vermuthung nicht fehlgehen, das wir als Stammeltern die *Verbena chamaedrifolia* (*V. melissoides* Sweet) und ihre rothe Varietät *Verbena melindres* Gillies, *V. teucrioides* und *incisa*, die unter Nr. 5 und 6 beschriebenen Arten, und endlich *Verbena phlogifera* Chamisso, welche am Ende wohl blosze Formen einer und derselben Stammart sein könnten, anzusehen haben.

"Die botanischen Merkmale der Gartenverbenen sind dieselben, wie wir sie für *Verbena teucrioides* angegeben haben.

"Die Gartenverbene ist so sehr veränderlicher Natur, dasz man bei jeder Aussaat von Samen, die man von Varietäten sortenweise oder in Melange geerntet hat, auf das Auftreten neuer Varietäten rechnen darf. Darum vermehrt sich die Zahl der in Kultur befindlichen Varietäten fortwährend und aus demselben Grunde ist der Bestand der Collectionen sehr wanderbar, zumal von den älteren Varietäten, wenn ihre blumistischen Werthe in neueren übertroffen sind, die meisten aufgegeben und nur einige wenige beibehalten zu werden pflegen, welche in Form, Haltung und Goösze oder Colorit aus dem Mittelgute hervorragen.

"Mit Ausnahme des reinen Gelb und des Schwarz sind bei der Gartenverbene alle Farben vertreten und durchlaufen vom reinsten Weisz und Indogoblau bis zum leuchtendsten Roth die ganze Farbenscala; man hat rosenrothe, bläuliche, lilafarbige, amaranthrothe, purpurrothe, carmoisinrothe, barune, schieferfarbige u.s.w. in den verschiedensten ausgezeichneten schönen oder auffallenden Nuancen. Die meisten Varietäten sind einfarbig, andere panachirt, marmorirt oder schattirt, geäugelt, gesternt, gerandet; einige zeigen sammetartige Färbungen, Reflexe u.s.w.

"Die geschätztesten Varietäten vereinigen in sich folgende Merkmale: Einen kräftig entwickelten Blüthenstand (Traube oder Bouquet) von der Form einer lieber gewölbten und etwas kegelförmigen, als flachen Dolde; eine grosze substanzreiche Blume mit ausgebreitetem, flachem, regelmäszigem, rundem, nicht zerknittertem Saume. Was die Farbe betrifft, so ist jedes lebhafte, neue oder auffallende Colorit werth erhalten zu werden, indessen giebt man denjenigen Blumen den Vorzug, bei denen die Färbung des Kronensaumes von der des Schlundes (Auges) verschieden ist, um welchen herum die Farbe des Saumes einen vollkommenen und klar abgesetzten Zirkel bilden musz."

On page 1264 he lists var. *auriculiflora* Hortorum ("Aurikelblüthige Verbene") and says of it: "Bei dieser ausgezeichneten Race, die aus Samen erzogen ihre Charakter ziemlich treu bewahrt, ist das Auge besonders kräftig entwickelt, reinweisz oder gelblichweisz und in scharfer Linie von der meistens lebhaften Saumfarbe abgesetzt, so dasz sie verhältniszmäszig groszen Blumen denen ainer Aurikel in Etwas ähnlich sind; diese Race ist sehr beliebt und verbreitet."

On page 1265 he lists var. *striata* Hortorum ("Italienische Verbene") and describes it as follows: "Diese Race, deren Ursprung durch ihren Namen bezeichnet wird, ist jetzt weniger geschätzt, als noch vor einigen Jahren. Man hat von ihr einige durch sehr grosze und auf weiszen Grune roth, rosa, blau u.s.w. gestreifte Blumen ausgezeichnete Varietäten. Bei einigen anderen sind die Blumen halb von diefer, halb von einer anderen Farbe und es ist gar nicht selten, auf einzelnen Stöcken und selbst in den Blüthenbouquets eines und desselben Stockes in vollkommender Weise gestreifte, zweifarbige und einfarbige Blumen zu finden, letztere bald in der Grundfarbe, bald in der Zeichnungsfarbe.

"Die Verbenen dieser Race sind zwar ziemlich unbeständig, aber doch recht hübsch und müssen, da die Anzucht durch Aussaat nicht recht zuverlässig ist, vorzugsweise durch Stecklinge vermehrt werden. Seit einigen Jahren hat man jedoch auf dem Wege einer recht umsichtigen Auslese eine Race erzielt, welche aus Samen ganz befriedigende Resultate giebt. Die italienischen Verbenen eignen sich ganz besonders zur Topfkultur.

"Wem wären die Gartenverbenen (Hybriden) unbekannt? Giebt es ja doch nur wenige Pflanzen, welche so allgemein kultivirt werden, wie sie. Und sie verdienen diese Gunst der Blumenfreunde durch die Leichtigkeit ihrer Kultur, durch ihre auszerordentliche Dauerhaftigkeit, durch den Reichtum ihres Flors, mit dessen Schönheit sich oft Wohlgeruch verbindet, durch die Mannigfaltigkeit des Colorits und durch den immensen Vortheil, dasz sie Blumen in einer sehr lange dauernden Folge und in Menge auftreten, und endlich dadurch, dasz sie wegen der Weise ihrer Anordnung zur Bereitung von Bouquets, zur Ausstattung von Vasen u.s.w. geeignet sind.

"Diese Pflanzen geseihen in jeder sonnigen und freien Lage und in allen lockeren, leichten und gesunden Bodenarten. Einige Frische und Dünger sind ihnen vortheilhaft. Bodendeckung und Begieszen im Sommer werden immer von den besten Erfolgen begleitet sein.

"Man bereitet aus den Verbenen Einfassungen, Gruppen und Teppichbeete von hoher Schönheit, deren Effekt sich durch Farbenmischung oder durch contrastirende bandförmige Pflanzung vielfach verändern läszt. Wegen der groszen Menge von Farbenvarietäten kann man die Verbenen in den Gärten ohne Einschränkung verwenden, ohne Einförmigkeit befürchten zu müssen. Diese Pflanzen breiten sixh rasch über den Boden aus, in dem sie sich einwurzeln und den sie mit ihren ausgebreiteten Zweigen (einige jedoch haben auffrecht stehende Zweige und bilden Büschel), mit Laub un Blumen bedecken, welche von Juli bis in den Spätherbst ununterbrochen auf einander folgen. Auch in Töpfen kultivirt sind sie reizende Pflanzen, die sich bei der Ausschmückung von Stellagen, Balcons, Terrassen, Fenstern u.s.w. vortheilhaft verwenden lassen. Auch bei der Bekleidung von Steingruppen, der Bodenoberfläche von Kästen, Töpfen u.s.w. leisten sie gute Dienste.

"Man vermehrt die Verbenen durch Aussaat und durch Stecklinge. Die Aussaat, welche den Vorzug verdient, weil man dadurch kräftigere und reicher blühende Pflanzen erhält, wird bewirkt: -- 1. Im März-April in das Mistbeet; man pikirt die Pflänzchen in das Mistbeet (oder in kleine Töpfe, die man im Mistbeet hält) und pflanzt sie zum Bleiben in Mai. Die Sämlinge blühen dann von Juli bis in den spätherbst. -- 2. Im August-September in das freie Land oder in Töpfe oder Kästchen mit recht gesunder leichter Erde oder Lauberde; die noch ganz jungen Pflänzchen pikirt man in die kleinsten Töpfchen und überwintert sie dicht unter dem Glas eines Lauwarmhauses; man entspitzt sie, wenn es nöthig sein sollte, und pflanzt sie in's freie Land im Mai; der Flor beginnt dann schon im Juni und dauert bis zum Eintritt der Fröste. -- Man kann die Verbenen in April-Mai auch recht dünn auf ein Gartenbeet oder gleich an den Platz säen, um noch gegen das Ende des Sommers hin einen gutem Flor zu erhalten. Die Verbenensamen sind im Keimen bisweilen seht eigensinnig; die am sorgfältigsten gepflegten Samen versagen mitunter ganz und gar, während die in das freie Land gesäeten und sich selbst überlassenen oft sehr gut gedeihen. Es ist sogar nicht selten, ausgefallene Verbenensamen im Frühjahre und bisweilen schon vom Herbst an aufgehen zu sehen. Wir wollen hier nicht unerwähnt lassen, dasz die schönsten Verbenen sehr wenig und oft gar keinen Samen geben, dasz die Varietäten aus Samen von dem Farbencharakter der Mutter abweichen, wenigstens wenn Kreuzbefruchtung stattgefunden hat und bei ganz specieller Auslese, und endlich dasz unter den Sämligen gewöhnliche Blumen und helle Farben vorwiegen, wie sehr auch die Samenträger durch Farbenpracht sich auszeichneten; immer aber wird die Aussicht, schöne Sämlinge zu erzielen, gröszer sein, wenn man die Samen von Pflanzen ersten Ranges und von Varietäten mit lebhaften und dunklen Blumen sammelt.

"Die schönen Varietäten, die man aus Samen erzogen hat, conservirt man, idem man die durch Stecklinge vermehrt, und das kann fast in jeder Zeit des Jahres geschehen; meistens aber bewirkt man diefe Vermehrung im Frühjahr, unter Glocken, in Mistbeete oder im Gewächshause mit krautigweichen Zweigen von Topfpflanzen, die man unter Glas überwintert hat, oder auch gegen den Herbst hin in Töpfen oder Schalen, unter Glocken, unter Glasfenstern oder auch im freien Lande mit bewurzelten Zweigen oder auch mit jungen Trieben; man topft sie einzeln vor Winters um, oder auch erst im Frühjahre. Diese Herbst-stecklinge werden unter Glasfenstern oder auf deb Tabletten eines Gewächshauses überwintert; wenn die Zweige zu lang werden, so entspitzt man sie, damit sie sich verästeln und nicht durch einen zu frühen Flor sich abschwächen. Im Mai, wenn Frost nicht mehr zu befürchten ist, pflanzt man sie aus und hält dabei auf einen Abstand der Pflanzen von 25--50 Centimeter nach jeder Seite hin, je nach dem Zwecke der Pflan-

zung. Einige Gärtner machen ihre Stecklinge vorzugsweise im November in December in Schalen im Warmbeete aus noch krautigweichen Trieben von Pflanzen, die man in kalten Kasten gehalten und später angetrieben hat. Jede Schale besetzt man mit einer groszen Menge solcher Stecklinge und pflanzt diese zu Ende des Winters oder im Frühjahr auseinander. Diese krautigen Stecklinge halten sich im Winter besser, als die Stecklinge aus altem Holze. Andere ziehen es vor, Stecklinge in Februar-März im Warmbeete zu erziehen aus jungen Trieben, die von im Gewächshause überwinterten Stöcken genommen sind.

"Seit einigen Jahren hat man sich mit Erfolg bemüht, gewisse Varietäten soweit beständig zu machen, dasz sie sich, wenn auch noch nicht durchweg, doch zum gröszten Theile aus Samen farbentreu wiedererzeugen."

It is worth noting here that the Verbena hybrida names published in Rev. Hort. Belg. 35: 41--45 (1909) and 37: 364--365 (1911) are in a series of advertisements put in by Haage & Schmidt and are to be accredited to Heinemann, producer of the firm, not to Pynaert. Lemaire's V. teucrioides var. anaïs (and its variant designations) have previously been regarded by me as synonymous with V. platensis Spreng., but upon further study of the original description and plate, as well as what may be authentic material of the plant -- Herb. Hort. Basil. s.n. [Aug. 1841] in the Meisner Herbarium, said on the label to be a hybrid between V. teucrioides and V. tweediana -- I feel now that they should go in the synonymy of xV. hybrida.

Britton & Wilson (1925) refer to our plant as V. chamaedrifolia Juss., while Calderón & Standley (1941) refer to it as V. teucrioides Gill. & Hook. L. H. Bailey describes all his collections from Florida, California, Alabama, and North Carolina as "perennial" or "wintered over". He notes on P. L. Hall 63 that the anthers are definitely not appendaged. MacMillan (1943) recommends the plant "for arid or subarid regions". Cornhill (1880) says "The Verbena was formerly one of the most admired and effective of summer bedding plants. Like the Calceolaria, however, it cannot be depended upon to last in good condition, and it is only in a few favoured places that it thrives with the vigour necessary to produce good effect. Notwithstanding this serious drawback to its culture, many new varieties of rare merit continue to be raised, and those who only know the Verbena as a bedding plant would be surprised and charmed to see how well it lends itself to pot culture. Amongst the show varieties are to be found colours of the most brilliant as well as the most chaste and refined description, and the trusses are so large as to surprise those who may only be acquainted with the ordinary bedding kinds. The culture of the Verbena is so simple that it may easily be undertaken by anyone possessed of an ordinary frame."

R. S. Miller (1891) says "Verbenas may be slipped and potted for winter blooming. They make really elegant window plants."

Burpee (1953) says "Colorful, dwarf plants, ideal for edging, ground cover, rock gardens, porch boxes, and cutting. The flowers are borne in large trusses from midsummer until late fall. Thrive in poor soil, and withstand drought remarkably well." Peter Henderson says "Sow in shallow boxes of light soil in the greenhouse, hot-bed or light window in a temperature of from 60 to 70 deg., covering the seeds to a depth of only four times their size, press down with a board firmly, water with a fine spray, and do not allow the seedlings to dry out. Transplant 1 inch apart into similar boxes or 2 inch pots as they require, if plants in pots are desired, when the seedlings have formed 2 or 3 leaves, and plant out in the garden after danger from frost. They can also be sown in open ground, after danger is over from frost." Ferry says "Verbenas usually flower well in August from seed sown in open ground in May. Germination will be hastened if the seed is soaked in lukewarm water before planting. It is desirable to have the soil well fertilized and carefully pulverized. Cover the seed about one-fourth inch of fine soil firmly pressed down. When the young plants have three or four leaves transplant in rows two feet apart and about twenty-four inches apart in the row. At this distance the plants, if conditions are favorable, will spread so as to cover the ground completely. Earlier blooming may be had if the plants are started indoors and transplanted in the open ground after danger of killing frost is over." Burpee advises "Sow the seeds early in the spring in shallow boxes of rich soil and place in a warm sunny window for transplanting into the garden when the maples are in full leaf; or, the seeds may be sown outdoors during April and May, either in a special seed-bed or right where the plants are to bloom. Keep the seed-bed moist, because the seeds require 3 to 4 weeks before they will germinate. When the plants are large enough to be handled, thin or transplant to stand 12 inches apart in a row. Soaking the seed in water 12 hours before sowing usually helps to quicken germination. Verbenas do best in rich soil."

Vaughan (1959) says "These colorful annuals originated as desert plants, and thrive in the sun, flowering continuously. They make gay garden beds, and bouquets. Do not sow the seed outdoors until the soil gets warm (May 15th to June 1st). May also be started indoors to advantage. Grow only 6 to 12 inches tall but spread to 2 feet across, Seeds germinate in 8 days."

xVerbena hybrida was at one time commonly propagated by cuttings to keep the various named color forms true, as some of the quotations given above indicate, but such plants were found to be difficult to keep through winter. Seedsmen have now developed strains which remain quite constant, and the clonal stocks are now dispensed with. This hybrid is of somewhat diffuse habit, free-flowering, and with a considerable range of color making it excellent for summer bedding; some forms are pleasantly scented. The various strains offered in the trade are doubtless of hybrid origin, the result of crossing V. peruviana, V. incisa, V. phlogiflora, and V. platensis in various combinations. Treated like other half-hardy annuals, the seedlings should be planted out about the end of May about 1 foot apart. By this time they will be beginning to flower and any clashing colors may thus be avoided. The growth is semi-trailing and the plants may be pegged down to give good ground cover. They may thus be used as a carpet for taller plants of other types. Their flowering will continue until November in the Northern Hemisphere if the weather is open. They need a sunny position and a well-drained soil. They may also be grown as pot plants with the necessary stopping and supports to counteract their spreading habit. Verbenas appear to be worthy of wider cultivation for summer bedding especially where snapdragons (*Antirrhinum majus*) suffer from rust and its consequent disfigurement. They are very desirable for massing in beds on the lawn. The large clusters of showy flowers are borne in succession through a long season until frost. The seeds sell in the United States at 15--50 cents per packet, 70 cents to $1 per one-quarter ounce, $2.50 to $3.50 per ounce, and rooted cuttings in 2 1/4 inch pots for $2.50 to $6 per 100, or $20 to $55 per 1000.

In the "language of flowers" the pink verbena is said by Ingram (1887) to symbolize family union.

Under the name of *V. teucrioides* Gill. & Hook. the longevity of this plant's seeds is reported on by Barton (1939). She used the variety "Royal Bouquet Mixed" from W. Atlee Burpee Seed Company, Philadelphia. She reports that the seedlings produced from seeds planted after one year of storage were badly infected with damping-off fungus, a condition which did not exist in any of the other soil plantings. She says that there were indications that fluctuation in moisture content was deleterious after the seeds had absorbed water up to the critical point. This was shown by data in which seeds with various moisture content placed in hermetically sealed tubes not opened from the time of storage until the time of testing were compared with those in containers which were opened and re-sealed at intervals.

Beale, Price, & Scott-Moncrieff (1940) discuss in detail the chemistry of the corolla color variations. Their work is summarized as follows: "1. The following types of variation in the flower pigments of *Verbena* [*hybrida*] have been established: (a) The anthocyanidins may be pelargonidin, delphinidin, or mixtures of these with each other or with cyanidin (*i.e.*, all combinations except cyanidin alone). (b) The anthocyanins may be 3-monosides or 3:5-dimonosides. (c) The anthocyanins may or may not be acylated. (d) The non-acylated types have a more alkaline cell-sap, and in them the pigment is more densely aggregated. (e) The anthocyanins may be partially or completely inhibited; if the former, there is an increase in anthoxanthin copigmentation. (f) The anthoxanthins (in flowers not containing anthocyanin) may be luteolin (in yellow flowers) or an undetermined flavone (in white flowers). 2. The inheritance of these variations is contrary to rule in other plants in the following respects: (a) Pelargonidin derivatives are sometimes dominant, sometimes recessive to delphinidin. (b) Monosides are sometimes dominant, sometimes recessive to dimonosides.

(c) Mixtures of anthocyanins occur, due to incomplete dominance or to modifying factors. These irregularities are considered to be due to the interspecific origin of the garden *Verbena*. The other variations are not abnormal as regards dominance, direction of mutation, or gene-interaction, in so far as they can be compared with homologous differences in other plants."

Beale (1940) says "There is little doubt that crossing has been attempted by horticulturists. Lecocq (1852) reports having crossed *V. incisa*, *V. 'teucrioides'* [=*V. platensis*] and *V. 'Melindres'* [=*V. peruviana*], givan an account of a technique for emasculation and pollination much the same as that used in this work. Some of the variations of the modern garden strains appear to have arisen as mutations after the original crosses were made, *e.g.*: (1) Pure white flowers. (2) Yellow flowers (said to have appeared in 1896). (3) Deep bluish purple flowers (first appeared in 1854). (4) Compact habit (arose in 1870 at Erfurt). (5) Striped or flaked flowers (known already in 1849). Further, as a result of inbreeding, a number of semi-lethal types have appeared in the experimental cultures." He says that the best germination is secured if seeds are soaked in water for 24 hours just before planting, and that "Self-fertilization occurs naturally except in a few forms in which the stigmas project out of the corolla tube." He enumerates the characteristics of the four parental species entering into this hybrid as follows: *V. peruviana* -- very prostrate habit, flat cotymbose inflorescence, bright scarlet flowers, with a very small yellow "eye" with a dark inner rim, introduced in about 1826 from Argentina; *V. phlogiflora* -- upright habit, the spikes longer than those of *V. peruviana*, the flowers scarlet-magenta, with a medium-sized yellow "eye", introduced in 1834 from Rio Grande do Sul, Brazil, etc.; *V. incisa* -- upright habit, the leaves more deeply lobed than those of *V. phlogiflora*, with a broad and depressed corymbose inflorescence as in *V. peruviana* and scarlet-magenta flowers, which fade out, and a medium-sized yellow "eye", introduced in 1836 from Santa Fé, Argentina; and *V. platensis* -- upright habit, more erect than any of the other species, the spikes 6--9 inches long, much longer than those of any of the other species, the flowers opening white, later pale-pink, introduced in 1837 from Buenos Aires, Argentina. His description of *V. phlogiflora* is certainly erroneous as to flower-color, since this species typically has lilac, violet, or purple flowers! He goes on to describe several genetic forms of *xV. hybrida*: "Compact" is distinguished from the normal by having shorter internodes and no runners; "Long spike" has the inflorescences as long as 20 cm. and the corolla-tubes longer than in the normal; "Stellate" has the petal-lobes bent downward on a radial axis, while the whole plant is reduced in size, bears few flowers, and sets little seed; "Wrinkled" has both the corolla-lobes and -tube wrinkled, and the stigma projecting above the anthers; "Chlorina" or "Bleached dwarf" is a very small partially chlorotic plant, the cotyledons and first leaves green.

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NOTES ON ECUADOR PLANTS

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and collaborators

Between March and December of 1943 the author was in Ecuador, engaged in the collection of *Cinchona* and other members of the Rubiaceae. In addition, other plants were collected as time afforded. Some of these have been found to constitute new taxa, and have already been published by various botanists. Although a large part of the collection of over 2,000 numbers remains unstudied, the following report is an effort to record additional new taxa from this collection, as well as from the collections of other Ecuadorian botanists. All the specimens cited are deposited in the Herbarium of the Chicago Natural History Museum.

CYPERACEAE

CAREX AZUAYAE Steyermark, sp. nov.

Planta stolonifera, culmis trigonis efoliatis vel basi 1-2-foliatis 20-30 cm. altis 2 mm. diam., surculis sterilibus phyllopodiis, laminis erectis 15-45 cm. longis 3-5 mm. latis non septato-nodulosis marginibus serrulatis; inflorescentiis 12-17 cm. longis; bractea infima foliacea erecta inflorescentiam manifeste superante 20-25 cm. longa 3 mm. lata evaginata vel fere evaginata, vaginae parte clausa ca. 2 mm. longa; spicis 6-7 erectis densifloris tenuipedunculatis; spicis terminalibus masculis ca. 4 cm. longis, lateralibus plerumque gynaecandris tenuipedunculatis lineari-cylindricis 4-5.2 cm. longis 3-3.5 mm. diam. cum parte terminali brevi mascula 4-6 mm. longa et parte foeminea 3-4.5 cm. longa; glumis foemineis atropurpureo-castaneis caducis oblongis obtusis perigyniis brevioribus 2.25-2.5 mm. longis 1.5 mm. latis, dorso carinatis, carina pallido-viridescente vel brunnea, marginibus hyalinis; stigmatibus 2; perigyniis fulvis demum atrobrunneis vel purpureo-brunneis adpresso-adscendentibus inaequaliter biconvexis ovatis 2.75 mm. longis 1.3--1.4 mm. latis bicostatis dorso basin versus obsolete paucinervatis ceterum ut videtur nonnervatis basi longistipitatis in rostrum fuscum integrum apiculatum 0.15-0.2 mm. longum attenuatis; achaeniis brunneis lenticularibus biconvexis suborbicularibus 1.75 mm. longis 1.25 mm. latis reticulatis.

ECUADOR: Prov. Azuay: páramos in vicinity of Toreador, between Molleturo and Quinoas, alt. 3785-3900 m., June 15, 1943, *Julian A. Steyermark* *53105* (holotype, F).

This well-marked species is characterized by the pedunculate, long slender spikes, obtuse pistillate scales, very granular-roughened, long-stipitate, practically nerveless or obscurely nerved perigynia, reticulate surface of achenes, elongate leaves, stoloniferous, stout, elongated culms, and the lowest bract conspicuously exceeding the inflorescence.

This is a member of the Subgenus Eucarex, Sect. Acutae, Subsection Vulgares, apparently related to C. Andersonii Boott and C. decidua Boott of Chile and Argentina on the one hand, and to C. strictior Dewey and related species on the other hand. It resembles the latter in the granular-roughened perigynia, but differs from it and related members of the group to which it belongs in the phyllopodic culms and long-stipitate perigynia. From C. Andersonii Boott, C. decidua Boott, and C. Hindsii Clarke, and others, it differs in its very granular-roughened perigynia, shape and size of perigynia, much longer and more slenderly pedunculate spikes, and stouter culms and leaves.

CAREX TOREADORA Steyermark, sp. nov.

Planta stolonifera, culmis 7-15 cm. longis 1.5-2 mm. crassis, angulis striatis, infra spicas minute scabridulis; foliis 6-16 cm. longis 2-3 mm. latis culmis plerumque brevioribus, marginibus minute scabridulis, supra canaliculatis, surculis sterilibus numerosis apice foliosis; inflorescentiis lanceolato-ovatis 1.5-2 cm. longis 6 mm. crassis; spicis crebris sessilibus ebracteatis vel glumis infimis brevissime bracteatis; spiculis 4-5 gynaecandris ovatis densifloris 6-8 mm. longis 2.5-4 mm. latis; spicae infimae bractea infima 4-5 mm. longa aristata; glumis foemineis pallido-ferrugineis vel rufis late suborbiculari-ovatis apice rotundatis vel obtusis usque breviter mucronato-acutis perigyniis brevioribus 2.5 mm. longis 2 mm. latis, marginibus hyalinis; stigmatibus 2; perigyniis maturis atrobrunneis adpresso-erectis plano-convexis ovato-lanceolatis 3-3.25 mm. longis 1.5 mm. latis, superficie ventrali plana enervata, dorso convexo enervato, vel obsolete 3-nervato, in rostrum paullo scabridulum attenuatis, ore bidentato, marginibus vix angustateque alatis; achaeniis fulvis lenticularibus late ovoideis 1.5 mm. longis 1.2 mm. latis.

ECUADOR: Prov. Azuay: páramos in vicinity of Toreador, between Molleturo and Quinoas, in moist mossy boggy places bordering alpine lake, alt. 3785-3900 m., June 15, 1943. Julian A. Steyermark 53095 (holotype, F).

The new taxon is characterized by the conspicuously stoloniferous rhizomes, broadly suborbicular, obtuse pale brown pistillate scales, non-bracteate to very shortly bracteate inflorescences, and nerveless or scarcely nerved perigynia. It is a member of the section Ovales, related to C. Mandoniana Boeck. (C. pinetorum Liebm.), but that species has acute, brighter brown scales, and more conspicuously bracteate spikes, and to C. macloviana D'Urv., in which the rhizomes are cespitose, the perigynia larger, conspicuously nerved, and broadly winged.

COMMELINACEAE

ANEILEMA ECUADORIENSIS Steyermark, sp. nov.

Herba erecta 0.6-0.9-metralis ramosa foliosa, ramulis horizontaliter patentibus; internodiis foliis brevioribus superioribus per unum laterem pilosulis ceterum glabris; vaginis 1.7-2 cm. longis marginibus apiceque hirsutulis ceterum glabris, ore truncatis; laminis oblongo-lanceolatis apice subito acuminatis, acumine 1.5 cm. longo, basi inaequaliter rotundatis vel late obtusis 11-13 cm. longis 4-5 cm. latis supra prope marginem minutissime puberulentibus ceterum glabris subtus glabris; inflorescentia terminali paniculato-racemosa 1.5 cm. longe pedunculata 5-7.5 cm. longa 3.5 cm. lata, rhachi in sicco 2.5 mm. lato pilosula multiflora, ramulis tenuibus numerosis horizontaliter patentibus 15-16 mm. longis glabris parte apicali 7-8 mm. longa 3-5-flora, bracteolis floralibus ovatis 1.5-3 mm. longis 1.25-1.5 mm. latis; bracteis ramulos subtendentibus lineari-subulatis acuminatis patentibus 7-8 mm. longis; floribus non visis.

ECUADOR: Prov. Azuay: rich dense jungle between Chacanceo and Río Blanco, on road to Molleturo, between Río Putucay and Río Norcay, alt. 1,220 m., June 3, 1943, *Julian A. Steyermark 52813*; leafy side branches spreading horizontally; rachis and pedicels dark violet (holotype, F).

This species is characterized by the slender, glabrous, horizontally spreading branches of the inflorescence, the closely bracteolate floriferous apical half of the branches, and the densely ciliate margins of the leaf-sheaths. The generic position of this plant is uncertain, because of the lack of flowering material. It resembles some species of *Floscopa* and *Dichorisandra*, as well as *Murdannia* (i.e. *M. gardneri* [Sueb.] Bruckn.), but shows affinity with *Aneilema ovato-oblongum* Beauv. because of the conspicuously bracteolate and elongated branches of the inflorescence.

TRIPOGANDRA PARVIFLORA (R. & P.) Steyermark, comb. nov.

Tradescantia parviflora R. & P. Fl. 3: 43. *pl. 272*. 1802.

ECUADOR: Prov. Azuay: west of Patul 3 kms., between Guagualcoy and Río Patul below Pasas de Pinglion, alt. 2725 m., May 19, 1943, *Steyermark 52622*; petals rose (F). Prov. Loja: between Tambo Cachiyacu, La Entrada, and Nudo de Sabanillas, alt. 2500-3500 m., October 7, 1943, *Steyermark 54456* (F).

TRIPOGANDRA MULTIFLORA (Sw.) Steyermark, comb. nov.

Tradescantia multiflora Sw. Fl. Ind. Occ. 1: 599. 1797.

ZINGIBERACEAE

COSTUS ZAMORANUS Steyermark, sp. nov.

Herba erecta 1.75-2.5-metralis, caulibus foliigeris a floriferis discretis; caulibus foliigeris foliosis 8-17 mm. diam. crassiusculis glabris multifoliosis; foliis numerosis, vaginis adpressis 4-7.5 cm. longis glabris arcte striato-nerviis apice truncatis; laminis ellipticis vel lanceolato-ellipticis apice acutis vel acuminatis basi cuneatim acutis 20-26 cm. longis medio 4-9 cm. latis; caule florigero scaposo saltem 45 cm. alto, foliis omnibus ad vaginas rigidas 5 cm. longas 18 mm. latas glabras papilloso-verruculosas reductis apice obliquis subtruncatis; inflorescentia terminalis subgloboso-ovoidea 9 cm. longa 6.5-7.5 cm. lata, bracteis rubris calycem superantibus arcte imbricatis inferioribus depresso-suborbicularibus apice rotundatis superioribus late ovatis apice rotundatis vel obtusis 4-4.5 cm. longis 2-4.2 cm. latis glabris extus apicem versus papilloso-verruculosis costato-nerviis; bracteolis lanceolatis obtuse acutis 2.8-3 cm. longis 5-6 mm. latis carinatis; calyce rubro turbinato-cylindrico vel profunde campanulato 12-13 mm. longo 6-8 mm. lato extus glabro costato-nervio 3-lobato, lobis late deltoideis subacutis 2-3 mm. longis 5-7 mm. latis; ovario 7 mm. longo.

ECUADOR: Prov. Santiago-Zamora: along Río Valladolid, around Tambo Valladolid, alt. 2000 m., October 14, 1943; flowering spikes arising from ground at base of leafy shoots; bracts of flowers firmly subcoriaceous, deep rose-red in lower half, pale salmon above; bracts red; calyx red; leaves pale gray-green below, glabrous; plant 5-8 feet tall; *Julian A. Steyermark 54664* (holotype, F).

This species is distinguished by the separate fertile and sterile stems, glabrous nerves and lower surface of the leaf-blades, and rounded to obtuse, callose-lineate bracts of the inflorescence. It is related to *Costus geothyrsus* Schum. and *C. erythrocoryne* Loes. From the former it differs in the acuminate narrower leaf-blades and broadly rounded to obtuse, non-appendaged bracts of the inflorescence, while from the latter it differs in the glabrous bracts and glabrous nerves and lower surface of the leaf-blades.

RENEALMIA PUBERULA Steyermark, sp. nov.

Herba erecta, caulibus foliigeris a florigeris discretis; caulibus foliigeris cum caulibus crassiusculis; foliorum vaginis longissimis arcte striato-nerviis extus dense minutissimeque adpresso-puberulentibus pilis stellulatis instructis; laminis oblanceolatis apice acuminatis basi cuneatim acutis supra glabris subtus minutissime stellulato-puberulentibus 38-44 cm. longis 8-8.5 cm. latis; caule florigero 30 cm. alto, foliis omnibus ad vaginas 4.5 cm. longas vel longiores dense adpresso-puberulentes pilis stellulatis reductis; inflorescentia oblonga multiflora densifloraque 10 cm. longa 4-5 cm. lata pedunculo dense puberulenti; bracteis late oblongis apice rotundatis vel obtusis; calyce profunde campanulato vel breviter cylindrico 6-9 mm. longo extus dense puberulis pilis stellulatis instructis, lobis 3 ovatis acutis vel obtusis 3.5-5 mm. longis 3.5-4 mm. latis; ovario 4-5-ovulato extus dense puberulo pilis stellatis instructo; capsula 7-9 mm. longa extus dense puberulo pilis stellatis instructa; seminibus 4-5 ovali-orbicularibus cano-brunneis laevibus 3.5

mm. longis 3 mm. diam.

ECUADOR: Prov. Napo-Pastaza: along Río Pastaza below Finca Black, densely forested slopes between Río Topo at Topo and Mera, alt. 1212 m., November 6, 1943; inflorescence arising from ground, 1 foot tall; bracts dull brick-reddish orange; corolla pale yellow; leaves pale green below; plant acaulescent; *Julian A. Steyermark 54901* (2 sheets, holotype, F; flowering sheet no. 1213602; foliage sheet no. 1213612).

This species is distinguished by the relatively short calyx, the congested densely-flowered inflorescence, and by the tomentum covering the lower leaf-surface, leaf-sheaths, bracts, peduncle, calyx, and ovary.

From *R. spicata* Gagnepain it differs in the larger calyx, more congested inflorescence, puberulent lower leaf-surface, puberulent sheaths, and densely tomentose peduncles. From *R. thyrsoidea* (R. & P.) Poeppig & Endlicher it differs in the 4-5- instead of 30-36-seeded capsules, smaller calyx, flowers tomentose on calyx and ovary, and the puberulent lower leaf-surface.

RENEALMIA STELLULATA Steyermark, sp. nov.

Herba ad 75 cm. alta, caulibus foliigeris a florigeris discretis; caulibus foliigeris cum foliis paucis, vaginis longissimis arcte striato-nerviis, apice subito rotundatis; laminis late lanceolatis vel lanceolato-oblongis apice anguste acuminatis, 29-30 cm. longis medio 7.5-8 cm. latis, acumine 1 cm. longo, basi cuneatim angustatis utrinque glabris; caule florigero scaposo 5.3 dm. longo, foliis omnibus as vaginas rigidas 8.5—13 cm. longas dense adpresso-puberulentes reductis; inflorescentia parva 7.5 cm. longa 4.5-5 cm. lata, rhachi in sicco 4 mm. lato dense breviterque stellulato-furfuraceo; bracteis lanceolatis vel subelliptico-oblongis 17-38 mm. longis 6-8 mm. latis costato-nervatis extus apice basique puberulentibus ad apicem pilis minutissimis stellulatis instructis ceterum parce remoteque puberulentibus vel glabrescentibus; floribus pedicellatis, pedicellis 4.5-5 mm. longis stellulato-puberulentibus; calyce turbinato-cylindrico in anthesi 11-12 mm. longo in fructu 13-14 mm. longo, lobis late deltoideis 3 mm. longis extus apicem versus minutissime stellulato-puberulentibus ceterum paullo remoteque stellulato-pubescentibus vel glabrescentibus; corolla albida 22 mm. longa, tubo hypocrateriformi 14 mm. longo 1-1.5 mm. lato, lobis 3 late oblongo-suborbicularibus obtusis 7.5-8 mm. longis 6.5 mm. latis; labello unguiculato 10 mm. longo trilobato medio 8 mm. lato, lobis lateralibus principalibus rhomboideo-suborbicularibus 8 mm. latis attingentibus, lobis basalaribus lanceolatis minoribus 2 mm. longis; anthera 5 mm. longa; ovario 9-ovulato minutissime extus stellulato-puberulenti; fructu extus prominenter stellulato-puberulenti.

ECUADOR: Prov. El Oro: forested slopes along quebradas tributary to Río Palma (tributary to Río Amarillo), near Pampa de los Cedros, south of Cerro Chivo-turco, alt. 2135-2285 m., Aug. 11, 1943; common; calyx and ovary deep rose; corolla white; bracts dull salmon-brick; *Julian A. Steyermark 53769* (holotype, F).

This species is distinguished by the stellate tomentum of rachis, peduncle, ovary, and sheaths, and by the relatively large flowers. From R. micrantha Schum., in which species the rachis is stellate-pubescent, it differs in the larger corolla and calyx, shorter peduncle, different labellum, and puberulent instead of glabrous leaf sheaths. From R. breviscapa R. & P. it is distinguished by the stellate-puberulent rachis and ovary, white instead of yellow corolla, and somewhat larger corolla, while from R. oligosperma Schum. it differs in the puberulent instead of glabrous peduncles, stellulate-puberulent instead of glabrous ovary, and more numerous ovules and seeds.

PROTEACEAE

ROUPALA OBOVATA H.B.K. var. ECUADORENSIS Steyermark, var. nov.

A var. obovata differt laminis foliorum ovatis vel ovali-oblongis basi rotundatis vel obtusis, costa media nervis lateralibusque subtus ferrugineo-tomentellis; petiolis dense fusco-tomentellis; racemis fructigeris 8.5 cm. longis; folliculis extus dense ferrugineo-tomentellis.

ECUADOR: Prov. Loja: along Río Cachiyacu at Tambo Cachiyacu, alt. 2000 m., Oct. 20, 1943; tree 30 feet tall; Julian A. Steyermark 54825 (holotype, F). PERU: Huanuco: Mito, alt. 2550 m., Macbride 3447 (paratype, F).

Sleumer has identified the specimens cited above with R. obovata H.B.K. (Proteaceae americanae. Bot. Jahrb. 76, part 2: 159. 1954). In his key to the species of Roupala (loc. cit. p. 146-147) Sleumer describes the base of the leaf-blades of R. obovata as "basin versus late cuneata". The original description of R. obovata Kunth (in H.B.K. Nov. Gen. Sp. Pl. 2: 153. 1817) states that the leaf-blades are "utrinque acutiusculis". This is clearly shown by the illustration (plate 120) in the same work. Moreover, the original description states that the leaves are "glabra" and that the petiole is "glaber". The type was collected in Colombia "prope Quilichao et Popayan" and is matched by later collections from Colombia.

The material from Ecuador and Peru thus appears to represent a geographical variation distinguished by the broadly rounded or broadly obtuse base of the leaf-blades with denser tomentum on the petioles and lower midrib and lateral nerves.

MONIMIACEAE

SIPARUNA RUGOSA Steyermark, sp. nov.

Arbuscula dioica, ramulis leviter stellato-tomentellis; foliis breviter petiolatis, petiolis 5-10 mm. longis dense stellato-tomentosis; laminis subcoriaceis utrinque valde rugosis ovato- vel late oblongis apice subito acutis basi rotundatis vel subcordatis 6-10.5 cm. longis 4-5.5 cm. latis in toto margine arcte

denticulis obtusis duplicidenticulatis, supra leviter stellato-puberulis subtus dense stellato-pilosulis, supra costa media nervis lateralibusque etiam venulis tertiariis profunde sulcatis subtus costa media nervis lateralibusque etiam venulis tertiariis prominenter elevatis; nervis lateralibus utroque latere 12-14 paullo arcuato-adscendentibus; inflorescentiis foemineis axillaribus ad 2.5-3.5 cm. longe pedunculatis, pedunculis dense tomentosis pilis stellatis sordido-fulvis obtectis petiolis demum longioribus; floribus brevissime pedicellatis vel subsessilibus; receptaculo floris foeminei campanulato basi rotundato 2.5-3 mm. longo extus dense stellato-tomentoso, sepalis ovatis apice obtusis 1 mm. longis intus glabris extus dense stellato-tomentosis, velo plano medio depresso, ore minute vix aperto, stylis vix exsertis; fructu late obconico 8 mm. lato extus stellato-tomentoso.

ECUADOR: Prov. Pichincha: bajada de Lache a Condor Machay, Cordillera Occidental, alt. 2700-3100 m., Enero 18, 1944; pequeño arbol de hojas coriaceas, verde obscuro al haz y verde claro al envés; bayas rojas; utilizado en la preparacion del carbon "uso-caspi"; *M. Acosta Solis 7008* (holotype, F).

SIPARUNA VERRUCOSA Steyermark, sp. nov.

Arbuscula dioica, ramulis novellis dense tomentosis pilis stellatis sordido-fulvis obtectis; foliis petiolatis, petiolis 13-22 mm. longis dense tomentosis pilis stellatis sordido-fulvis obtectis; laminis lanceolato-ellipticis vel anguste oblongo-oblanceolatis apice subito breviter acuminatis basi subacutis 11-18.5 cm. longis 3.5-6.5 cm. latis in toto margine arcte denticulis obtusis denticulatis, supra dense stellato-asperulis subtus ruguloso-nervatis dense stellato-pilosulis, costa media subtus elevata; nervis lateralibus utroque latere 15-17 subhorizontaliter patentibus prope marginem anastomosantibus supra sulcatis subtus prominulis, venulis tertiariis subtus prominulis in anlaxe reticulatis; inflorescentiis foemineis axillaribus in anthesi 10-13 mm. longe pedunculatis in fructu ad 25 mm. longe pedunculatis petiolis brevioribus vel longioribus 2-floris, floribus 1-1.5 mm. longe pedicellatis, pedunculis pedicellisque dense stellato-tomentosis; receptaculo floris foeminei obconico 4 mm, longo basi subacuto extus dense stellato-tomentoso, sepalis obovatis obtusis 1.5 mm. longis intus tomentoso, sepalis ovatis obtusis 1.5 mm. longis intus glabris extus dense stellato-tomentosis; velo late convexo, ore vix aperto; stylis breviter exsertis; fructu subgloboso ad 1.5 cm. diam. extus stellato-tomentuloso.

ECUADOR: Prov. Imbabura: Urcusique, faldas occidental del Cotacachi, alt. 3300 m., Junio 19, 1944; planta arbustiva o arborea de hojas lanceo-acuminadas; frutos aromaticos; *M. Acosta Solis 8233* (holotype, F).

From *S. phaneroneura* Standl. of Ecuador this species may be distinguished by the more attenuate tips and bases of the leaf-blades, fewer, more horizontally spreading lateral nerves, and longer, differently shaped leaf-blades.

BRUNELLIACEAE

BRUNELLIA PAUCIJUGA Steyermark, sp. nov.

Arbor 7.5-metralis, ramulis glabrescentibus; foliis oppositis imparipinnatis 1-2-jugis; petiolis 2.5-7.5 cm. longis supra sulcatis glabris; petiolulis 1-3 cm. longis glabris; laminis coriaceis ovato-oblongis vel ovatis apice subacutis basi rotundatis vel late obtusis 5.5-12 cm. longis dense pruinoso-pulverulentibus vel adpresso-puberulentibus grosse crenato-serratis dentibus utroque latere 10-12, nervis lateralibus utroque latere 10-12 supra sulcatis subtus prominentibus rectis adscendentibus; inflorescentia terminali multiflora 1-2 cm. longe pedunculata in fructu 7.5 cm. longa 7.5 cm. lata; pedunculo paullo strigilloso vel glabrescenti; rhachi ramisque plerumque superne puberulis; pedicellis in fructu 2-2.5 mm. longis dense minutissimeque strigillosis; sepalis fructiferis 5-6 lanceolato-oblongis acutis 6 mm. longis 3 mm. latis extus minute denseque sericeis; folliculis 6-7 subsessilibus vel sessilibus lanceolato-ovatis acuminatis 8-15 mm. longis 5-6 mm. latis, pericarpio extus dense sericeo-tomentoso atque hirsutulo; seminibus anguste 3 mm. longis.

ECUADOR: Prov. El Oro: on ridge top with Cinchona, between Curtincapa and Guagra Uma, 8 mi. mortheast of Curtincapa on southwest slopes leading to Chapel, alt. 2790-2880 m., August 16, 1943; tree 25 feet tall; Julian A. Steyermark 53873 (holotype, F).

This species is distinguished by the 3-5-foliolate leaves with coarsely crenate-serrate leaflets which are densely pruinose-pulverulent or puberulent beneath, and by the glabrous petioles and petiolules. It is related to B. inermis R. & P. of Peru, from which it differs in the fewer leaflets with more coarsely crenate, fewer-toothed margins, and glabrous petioles and petiolules.

BRUNELLIA ZAMORENSIS Steyermark, sp. nov.

Arbor; foliis imparipinnatis submembranaceis ad 53 cm. longis 6-jugis; petiolis 13 cm. longis teretibus hirsutis; petioli rhachi dense hirsuta; foliolis subsessilibus lateralibus anguste lanceolatis apicalibus elliptico-lanceolatis apice anguste acuminatis basi asymmetricis acutis vel subacutis margine grosse serratis 12-19.5 cm. longis 3.5-5 cm. latis, supra sparse adpresso-pubescentibus subtus praecipue costa media nervisque pilosis pilis patentibus 0.5-0.75 mm. longis instructis; nervis lateralibus utroque latere 15-18 subtus prominulis; venulis tertiariis subtus laxe reticulatis prominulis; floribus non visis.

ECUADOR: Prov. Santiago-Zamora: in valley of moist forest at Arenillas along Río Tintas, between Campanas and Arenillas, 10 leagues southeast of El Pan, alt. 2195 m., July 13, 1943; leaves white below; Julian A. Steyermark 53576 (holotype, F).

The character of loose, hirsute pubescence on the rachis, stems, petioles, lower surface and midrib of lower leaf surface readily distinguishes this species. It is separated from B.

ecuadoriensis Cuatr. by the type of tomentum, the more numerous and larger leaflets, which are more narrowed at the base. From *B. oliverii* Britton, with which it shows affinity, it is distinguished by the long acuminate leaflets.

ROSACEAE

Bassett Maguire,
New York Botanical Garden

LACHEMILLA UNIFLORA Maguire, sp. nov. [Sect. *Aphanoides* (Perry) Rothm., Subsect. *Pachyrrhizae* Rothm.]

Perennes dense villosae pusillae; caulibus tenuibus prostratis 8-15 cm. longis adpresso-hirsutis, internodiis foliis longioribus; ramis lateralibus brevibus; foliis radicalibus tripartitis, laminis ovato-reniformibus 8-10 mm. longis 10-12 mm. latis multilobatis, lobis oblongo-lanceolatis, 1-2 mm. longis revolutis, superne adpresso-sericeo-hirsutulis, nervis valdissimis hirsutulis; petiolis 6-8 mm. longis; stipulis membranaceis, lobis libris deltoideo-lanceolatis acutis ca. 2 mm. longis ciliatis; foliis caulinis sessilibus, laminis 3-4 mm. longis, vaginis ca. 2 mm. longis, lobis 4-5, 1.5-2.5 mm. longis adscendentibus vel patentibus vel reflexis; floribus urceolatis 1-2, ca. 2 mm. longis; pedicellis 1-2 mm. longis dense hirsutulis persistentibus; hypanthiis ca. 2 mm. longis glabris, lobis 4 conniventibus oblongo-lanceolatis ca. 0.5 mm. longis subacutis sparse hirsutulis, bracteolis minutis 4 vel 1-2 obsoletis ca. 0.25 mm. longis linearibus acutis; staminibus 1-2; pistillis 6-8 brevi-stipitatis; acheniis 5-7 obtusis 0.7-0.8 mm. longis, stylis 1.5-2 mm. longis, subclavatis.

ECUADOR: Prov. Santiago-Zamora: moist places on páramo, trail between Pailas and El Pan, alt. 2255-3445 m., September 10, 1943; prostrate, gray-green leaves; *Julian A. Steyermark 54347* (holotype, NY; isotype, F).

Lachemilla uniflora belongs to the *L. frigida* complex, and is its northermost representative. Closest affinity seems to be with *L. pedicellata* Rothm. of Argentina, and, like it, from the description, has conspicuously long hirsute pedicels, few-flowered glomerules, and much reduced exterior bracteoles. But the flowers of *L. uniflora* are approximately twice the size of those of the Argentine species and produce twice the number of pistils and achenes, while the plant is much smaller with the leaves scarcely more than half the size.

Lachemilla uniflora is as distinct as any of the described species of the *frigida*-complex. It is not improbable that *L. uniflora* and others of the group represent no more than races of *L. frigida*. Such a situation is not to be unexpected in view of the prevalence of apomixis and other manifestations of genetical com-

plexity in the Potentilleae.

LACHEMILLA PROCUMBENS (Rose) Rydb. var. ANDINA (Perry) Maguire, comb. nov.

Alchemilla procumbens var. *andina* Perry, Contr. Gray Herb. 84: 23. 1929.

LEGUMINOSAE

Robert W. Schery

MIMOSA XEROPHYTICA Schery, sp. nov. Ser. Rubicaules

Arbor 7-metralis, ramulis juvenilibus tomentosis, ramis vetustioribus plus minusve glabris prominente lenticellatis longitudinaliter hriseo-striatis pauci-aculeatis, aculeis internodalis brevibus recurvatis; foliis bipinnatis pinnis plerumque 4-jugatis foliolis ca. 6-8-jugatis, petiolo (ca. 15 mm. longo) et rhachi (ca. 30 mm. longo) tomentoso eglanduloso, rhachibus secundariis ca. 30 mm. longis pulvinis apice brevi-biaculeatis, foliolis rhombico-oblongis 4-10 mm. longis 2-4 mm. latis sessilibus basi inaequilateraliter obtusis vel subacutis apice rotundatis supra glabris nitidis fuscioribus subtus subadpresso-tomentosis costa valde excentrica marginibus revolutis; stipulis aculeatis parius ca. 1 mm. longis; inflorescentiis ex axillibus terminalibus et subterminalibus, solitariis vel pauci-fasciculatis vel ex pedunculo primario 2-3-divisis, brevissime (ca. 3 mm.) spicatis ex pedunculo florifero ca. 15 mm. longo, bracteis minutis; floribus sessilibus albis, calycibus cupuliformibus ca. 0.8 mm. longis breviter 4-lobatis papyraceis subglabris, corollis infundibuliformibus ca. 2.5 mm. longis glabris 4-lobatis lobis ovatis ca. 1 mm. longis, staminibus 8 ? (6 visis); ovario hirsuto; leguminibus linearibus ad 7 cm. longis et ca. 8 mm. latis, planis, 5-7-segmentatis, breviter constrictis inter loculares, marginibus persistentibus ?, pauci-aculeatis.

A tree sparsely armed with recurved thorns, the leaves bearing about 4 pairs of equidistant pinnae, these with 6-8 pairs of moderately small leaflets glabrous above but pubescent and lighter beneath, with the costa markedly excentric and in some leaflets one or two smaller veins arising from the base also visible, any other venation not apparent. The stipules are modified as very small spines. The inflorescences are short-spicate on moderately elongate peduncles, and arise 1-few from the upper axils or sometimes secondarily from a primary peduncle. Vestiges of flowers show 4-merous calyx and corolla, especially the former thin and delicate; apparently the corolla is diplostemonous (vestiges of at least 6 stamens could be counted). The legume, not completely mature in the type, is lomentaceous, with 5-7 briefly oblong, 1-seeded sections that apparently separate from the thickened margin in maturity. The margins are sparingly aculeate and indented between the segments.

ECUADOR: Prov. Loja: desert country between Vilcabamba and

Cachiyacu, alt. 1600-2100 m., *Julian A. Steyermark 54368A* (holotype, M; isotype, F).

Unfortunately, the type of this unusual species possesses no complete flowers, so that it is impossible to determine whether or not the anthers are glanduliferous. If so, the species might need to be placed in *Prosopis* (Sect. *Lomentaria*, since it has glabrous corolla, lomentaceous fruit, and hairy ovary). The lomentaceous legume and eglandular leaves would likely restruct it from *Piptadenia*, another possibility. The 4-merous flower and aculeate-margined legume better fit *Mimosa* than any other generic possibilities, although the arborescent habit, and some leaf and legume characters are rather unusual in that genus. The specific name is in allusion to the desert country where Steyermark collected the type.

CLETHRACEAE

CLETHRA RUGOSA Steyermark, sp. nov.

Arbor, ramulis dense hirsutulis; foliis subcoriaceis utrinque manifeste rugosis petiolatis, petiolis 2.2-2.7 cm. longis dense tomentoso-hirsutulis; laminis late elliptico-oblongis apice rotundatis vel obtusis basi obtusis vel subrotundatis atque subinaequalibus 11-17 cm. longis 6-8 cm. latis supra valde rugosis minute puberulis pilis fasciculatis praeditis subtus rugosis dense fulvo-tomentosis subrevolutis minutissime remoteque denticulatis, nervis lateralibus utroque latere 15-17 adscendentibus in marginem desinentibus; inflorescentiis terminalibus vel ad apices ramorum brevibus 2.5-3 cm. longis, rhachibus dense ferrugineo-hirsutulis, floribus crebris sessilibus; sepalis oblongis vel oblanceolato-oblongis apice rotundatis vel obtusis 4-4.5 mm. longis 1.5-2 mm. latis extus tomentellis intus supra medium strigillosis, marginibus laxe tomentosis; petalis obovatis apice rotundatis glabris 3.8-4 mm. longis 2.5-3 mm. latis supra medium eroso-fimbriatis; antheris 1-1.5 mm. longis glabris; filamentis glabris 1.75-2 mm. longis; stylo glabro 1.5 mm. longo apicem versus ampliatis; stigmatibus 3-capitellatis; ovario extus dense tomentoso-hirsutulo.

ECUADOR: Prov. Santiago-zamora: sotobosque andino de Campanas, Cordillera Oriental, alt. 2850 m.; hojas coriaceas de color café claro al envés, Julio 20, 1943, *M. Acosta-Solis 5054* (holotype, F).

This taxon is characterized by the conspicuously rugose upper leaf surface, densely brown-tomentose lower leaf surface, the short racemes, and the small flowers.

APOCYNACEAE

Robert E. Woodson, Jr.

MANDEVILLA VERSICOLOR Woodson, sp. nov.

Frutex volubilis, ramulis elongatis crassiusculis pilosulis cortice rubro-brunneis. Folia opposita petiolata, lamina elliptico-ovata acuminata basi cordata 10-15 cm. longa 6-8 cm. lata membranacea utrinque pilosula supra nervo medio basi pauciglanduligera, petiolo 1-1.5 cm. longo, appendicibus interpetiolaribus stipularibus pluribus ca. 0.1 cm. longis. Inflorescentiae in axillis alternatis racemosae pluriflores pendentes, pedunculo 8-10 cm. longo dense puberulo, pedicellis ca. 2-2.5 cm. longis similiter vestitis, bracteis scariaceis ovatis ca. 0.1-0.2 cm. longis. Calycis laciniae ovato-lanceolatae longe acuminatae ca. 0.5 cm. longae extus dense puberulae intus basi pluriglandulosae. Corolla infundibulariformis extus glabra, tubo proprio ca. 2.2 cm. longo basi ca. 0.2 cm. diam. dilute viridi et rubromaculato, faucibus conicis ca. 1.5 cm. longis ostio ca. 0.6 cm. diam. basi staminigeris, lobis oblique obovatis ca. 3 cm. longis sordide croceis margine interiori salmo-rubro patulis. Anthera anguste oblonga basi truncata 0.8-0.9 cm. longa glabra. Ovarii carpella oblongoidea ca. 0.2 cm. longa glabra, nectariis 5 plus minusve connatis vix 0.1 cm. longis, stigmate umbraculiformi ca. 0.4 cm. longo longe apiculato.

ECUADOR: Prov. El Oro: between Paccha and Puente Grande, passing over Montaña de Pueblo Viejo, Cordillera Suchiquilla, etc., alt. 1830-2430 m., Aug. 26, 1943, Julian A. Steyermark 54154 (holotype, F).

Obviously allied to the western South American species of Subgen. Eumandevilla, Sect. Laxae, particularly M. veraguasensis, but differing in the unusually large flowers and lax, pendulous inflorescences which at first sight suggest the genus Temnadenia.

SOLANACEAE

CYPHOMANDRA VILLOSA Steyermark, sp. nov.

Arbuscula, ramulis dense fulvo-villosulis; foliis petiolatis, petiolis 1.2-2.5 cm. longis dense velutinis, laminis simplicibus ovatis apice subito subacuminatis basi subcordatis vel late rotundatis 6-7.5 cm. longis 3-4 cm. latis supra plus minusve dense adpresso-pubescentibus subtus molliter denseque velutinis integris, nervis lateralibus utroque latere ca. 6; nervis tertiariis subtus laxe transverseque reticulatis; inflorescentiis axillaribus vel subterminalibus bifurcatis 7.5-8 cm. longis 6-7 cm. latis 3.5-4.5 cm. longe pedunculatis, ramulis principalibus duobus 7-9 cm. longis quique ramorum saltem 5-6-flora, rhachi ramisque dense velutinis; pedicellis in anthesi 13-14 mm. longis in fructu 15-17 mm. longis dense pilosulis; floribus secundis fere scorpioideis; calycis tubo breviter cupulato-campanulato 1 mm. alto 4 mm. lato dense villoso, lobis 5 anguste triangulari-lanceolatis vel triangulari-subulatis acuminatis 3.5-4 mm. longis basi 1.75 mm. latis dense villosulis; corollis purpureis campanulatis 11-12 mm. longis, tubo 6-7 mm. longo basi 3 mm. lato fauce 8 mm. lato, lobis late ovatis subacutis 7.5 mm. longis 5-6.5 mm. latis extus villosulis intus glabris laxe reticulato-venosis; staminibus exsertis, antheris oblongis apice rotundatis 5-6 mm. longis 2.5 mm. latis glabris; filamentis 3 mm. longis glabris basi corollae insertis; stylo 10-10.5 mm. longo pilosulo; ovario glabro ovoideo-conico; bacca globosa 1.5 cm. longa 1.5 cm. lata glabra.

ECUADOR: Prov. Loja: region central: Las Chinchas, alt. 2250 m., Abril 12, 1944; arbustiva; flores moradas; bayas redondas, verdes; M. Acosta-Solis 7743 (holotype, F). Local name: "sabalucu".

This species differs from C. hypomalaca Bitter of Ecuador in the shorter petioles, smaller leaf-blades, fewer-flowered inflorescences, shorter pedicels, longer, narrower calyx-lobes with attenuate tips, and differently shaped broader fruit.

MARKEA GRANDIFLORA Steyermark, sp. nov.

Planta ligneosa, ramulis apice hirsutulis ceterum glabris; foliis coriaceis breviter petiolatis, petiolis 7-8 mm. longis glabris; laminis anguste obovatis vel oblanceolato-oblongis apice rotundatis basi angustatis acutis vel subacutis 6-9 cm. longis 2.5-3 cm. latis utrinque glabris, nervis lateralibus utroque latere 5-6 adscendentibus prope marginem conjunctis; floribus longipedunculatis; calyce tubuloso-campanulato laxe reticulato-venoso basi 4-carinato 5.5-6.5 cm. longo basi 1.7-2 cm. lato apice 3 cm. lato, lobis 4 ovatis subacutis vel obtusis 2.2-3 cm. longis 1.5 cm. latis; corolla calyce paullo longiore saltem 6.5 cm. longa; antheris lineari-oblongis 16 mm. longis 3 mm. latis; filamentis glabris; ovario conico 9 mm. longo.

ECUADOR: Prov. Pichincha: bajada de Loche a Condor Mackay, Cordillera Occidental, alt. 2700-3100 m., Enero 18, 1944; arborea o arbustiva; flores grandes, de peciolos largos, colgantes; corolla verdosa; M. Acosta-Solis 7009 (holotype, F).

The large calyx and corolla are characters of this species.

NIEREMBERGIA ESPINOSAE Steyermark, sp. nov.

Herba pusilla procumbens repensque 2 cm. alta, caulibus tenuissimis subfiliformibus glabris; foliis petiolatis, petiolis 3-10 mm. longis tenuissimis pilosulis; laminis elliptico-ovatis vel ovalibus apice rotundatis vel obtusis basi cuneatim acutis 6-9 mm. longis 3-7 mm. latis utrinque sparse pilosulis vel interdum glabrescentibus, nervis lateralibus utroque latere 1 vel 2 sed plerumque obscuris vel nullis; floribus solitariis subsessilibus; calyce tubuloso 5-5.6 mm. longo costato-nervio extus sparse pilosulo, lobis ovatis vel lanceolatis subacutis vel hebeti-acutis 1.5-2 mm. longis 0.75-1.5 mm. latis; corolla hypocrateri-infundibuliformi 14-16 mm. longa, tubo 7-9 mm. longo 0.5-0.75 mm. lato extus minute glandulari-puberulenti superne in faucem campanulatam 5-7 mm. longam 6 mm. latam subito dilatato extus pilis glandularibus remote obtecto apice in lobos breves late triangulares 2.5 mm. latos 0.5 mm. longos leviter desinente; ovulis ca. 20; seminibus ferrugineis subrhomboideis obtuse subtrigonis extremitatibus subtruncatis vel obliquis 1 mm. longis; testa alveolato-rugosa.

ECUADOR: Prov. Loja: en prados, Namanda, alt. 1500 m., Nov. 24, 1946; yerba menuda, rostrera; poco frecuente; flores acampanuladas, color blanco con ligero tinte rosado; Reinaldo Espinosa 1076 (holotype, F).

This species is characterized by the diminutive size of the plant and proportionately large size of the corolla.

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NOTES ON NEW AND NOTEWORTHY PLANTS. XXXIX

Harold N. Moldenke

ERIOCAULON BREVIPEDUNCULATUM var. LONGIPES Moldenke, var. nov.

Haec varietas a forma typica speciei pedunculis 3.5—5 cm. longis recedit.

This variety differs from the typical form of the species in having its peduncles 3.5—5 cm. long, usually subequaling the leaves.

The type of the variety was collected by R. D. Hoogland and R. Schodde (no. 7647) in a swampy patch in treefern grassland, at an altitude of about 8500 feet, in the Yobobos grassland area (source of Lagaip River), Laiagam Subdistrict, Western Highlands, New Guinea, on August 31, 1960, and is deposited in the United States Herbarium at Washington.

LIPPIA LASIOCALYCINA var. SAINTHILAIREI Moldenke, var. nov.

Haec varietas a forma typica speciei bracteis late ovatis ad apicem acutis vel subacutis recedit.

This variety differs from the typical form of the species in having its bracts broadly ovate and merely acute or subacute at the apex.

The type of the variety was collected by August François Cesar Prouvençal de Saint-Hilaire -- in whose honor it is named — at Olho d'Agoa, Minas Gerais, Brazil, between 1816 and 1824, and is deposited in the United States National Herbarium at Washington. It is a great pleasure to dedicate this distinct taxon to a collector who did such noteworthy and important work on the flora of Brazil and Uruguay.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS *VERBENA*. XIV

Harold N. Moldenke

xVERBENA HYBRIDA Voss

The genetic form "Chlorina" or "Bleached Dwarf" has its later leaves practically white, and it does not flower; "Strap" is a variable form sometimes with very narrow ribbon-like leaves, sometimes with almost normal ones, but the first pair is always narrow and entire, not broad and serrate, the more extreme forms fail to flower or else flower only during the second season after planting; "Nana" is a very small plant, to 6 inches tall, the leaves curled downward and sometimes wrinkled and mottled; and "Small" is up to about 12 inches tall and normal in leaf-shape and color, but is late-flowering. Dr. Chandler's Red Verbena Plant and Rose Verbena Plant are tetraploids, 2n = 20, while her Rose Red, Purple, and Magenta Verbena Plants are triploids, 2n = 15.

Salmon (1900) states that the fungus *Microsphaera ferruginea* Erikss. infests this plant, while in Biol. Abstr. 28: 3507 (1954) it is given as the host for a species of *Erysiphe*. Westcott (1950) reports that it is attacked by Flower Blight (*Botrytis cinerea*) in Massachusetts, by Root Knot Nematode (*Heterodera marioni*) in Maryland, by Stem Charcoal Rot (*Macrophomina phaseoli*) in Oklahoma, by three kinds of Root Rot -- *Phymatotrichum omnivorum* in Texas, *Rhizoctonia solani* in New York, and *Thielaviopsis basicola* in Pennsylvania,-- and by Powdery Mildew (*Erysiphe cichoriacearum*) everywhere. In her 1956 work she says that it is attacked by the Yellow Woollybear (*Diacrisia virginica*), Morningglory Leafcutter (*Loxostege obliteralis*), Verbena Leafminer (*Agromyza artemisiae*), Oblique-banded Leafroller (*Archips rosaceana*), Cyclamen Mite (*Steneotarsonemus pallidus*), Broad Mite (*Hemitarsonemus latus*), Two-spotted Mite (*Tetranychus telarius*), Fern Nematode (*Aphelenchoides olesistus*), Greenhouse Orthezia (*Orthezia insignis*), Flower Thrips (*Frankliniella tritici*), Greenhouse Thrips (*Heliothrips haemorrhoidalis*), Greenhouse Whitefly (*Trialeurodes vaporariorum*), Geranium Aphid (*Macrosiphon pelargonii*), Green Peach Aphid (*Myzus persicae*), Melon Aphid (*Aphis gossypii*), Verbena Budmoth (*Endothenia herbesana*), Tarnished Plant-bug (*Lygus lineolaris*), Foxglove Aphid (*Myzus solanii*), Cottony Cushion Scale (*Icerya purchasi*), Gray Blister-beetle, and Snapdragon Lace-bug.

Lundell reports that it is "planted for ornament throughout the state" of Texas. The *Keeling 64*, cited below, is labeled as having come from "sandy loam soil on campus", so may have been in cultivation. The *Collector undesignated 59*, also cited below, from Mexico, the *Carr s.n.* [Clinton] from Massachusetts, the *Liu* *s.n.* [Peking Union Medical College] from China, and the *L. H. Bailey 7155* and *7156* from Mississippi do not have any indication on their labels that they were taken from cultivated material, but I am assuming that they were. Neither the *Herb. Est. Cent. Agron. s.n.* [Nov. 1909] nor the *Fortune & Arias 7066*, cited below, from Cuba bear any indication on their labels that they came from cultivated material, but Dr. Acuña assures me that they did. The *Herb. Jard. Bot. Tananarive 1322*, cited below, from Madagascar is inscribed "subspontaneous". The *G. B. Grant 2503a*, cited below, is a mixture with *V. canadensis* (L.) Britton. Perry says "Probably cultivated — cf. *V. peruviana* (L.) Britt." for the *Kerber 470* collection cited hereinafter, but there is no indication on the label that it came from cultivated material. Similarly, there is no evidence that the *G. W. Barclay 528* cited below was cultivated — its label reads "herbaceous creeper, flowers rose coloured, soil - sandy loam - found in open habitations in the woods of Machala, Colombia, Oct. 1836."

Norton found x*V. hybrida* growing in low sandy bottomlands and open woods, while Radford found it in waste places in South Carolina. Stellfeld (1951) cites *Stellfeld s.n.* [Ilha do Mel, 5-11-94; Herb. Mus. Paran. 2075]. Schaffner (1933 & 1934) cites *L. E. Hicks s.n.* as escaped in Astabula County, Ohio.

Herbarium material of x*V. hybrida* is often found in herbaria under the name *V. incisa* Hook. On the other hand, the *Dole 343*, distributed as x*V. hybrida*, is actually *Gaillardia pulchella* var. *picta* A. Gray in the *Carduaceae*.

Standley (1938) applied the name *V. teucrioides* Gill. & Hook. to the commonly cultivated garden verbenas of Central America which are actually x*V. hybrida*. He says "*Verbena*. Cultivated commonly in gardens as an ornamental plant. Native of southern South America. The common garden verbena, with flowers ranging from white to pink, red, or purple, is a favorite garden flower of Central America, especially in the temperate regions. The proper specific name of the garden plants, which may be in part of hybrid origin, is somewhat uncertain."

In all, 259 herbarium specimens and 33 mounted photographs and illustrations have been examined by me.

Citations: PENNSYLVANIA: Beaver Co.: *Shafer s.n.* [Beaver Falls, Sept. 6, 1900] (Up). SOUTH CAROLINA: Darlington Co.: *J. B. S. Norton s.n.* [Apr. 8, 1921] (Hi—59462). Kershaw Co.: *A. E. Radford 20772* (Hi—92953). FLORIDA: Brevard Co.: *J. K. Small 8745* (N, W—1738341). IOWA: Boone Co.: *Pammel & Pammel s.n.* [Ogden, Sept. 20, 1924] (Io—116119). OKLAHOMA: Payne Co.: *Keeling 64* (St—17567). TEXAS: Val Verde Co.: *Parks & Cory 9003* (Tr), *9004* (Tr). CALIFORNIA: Ventura Co.: *H. M. Pollard s.n.* [San Antonio Creek, June 25, 1948] (Gg—343936). MEXICO: Nuevo León: *Roybal 28*

(W—1924914). Vera Cruz: Kerber 470 (W—1323143). PANAMA: Panamá: Paul 39 (W—1586935). CUBA: Havana: Van Hermann 867, in part (W—1145108). COLOMBIA: Antioquia: Toro Toro 935 (Fn—1663, N). ECUADOR: El Oro: G. W. Barclay 528 (Bm). BRAZIL: Federal District: Frazão s.n. [Herb. Jard. Bot. Rio Jan. 7402] (N). Minas Gerais: Sampaio 21 (Ja—46750). Rio de Janeiro: Rocha e Silva 54 (Ja). São Paulo: Santoro s.n. [Campo Experimental; Herb. Inst. Agron. S. Paulo 7613] (Be—35758). SWEDEN: Nilsson s.n. [Sept. 1907] (Go); Wide s.n. [Malmö, Okt. 1897] (Go). CONGO LEOPOLDVILLE: Bredo 1153 (Br). TANGANYIKA: A. Peter 37891 [V.168] (B). MADAGASCAR: Baron 3619 (K, P); Herb. Jard. Bot. Tananarive 1322 (P). CULTIVATED: Alabama: L. H. Bailey 7048 (Ba). Amoy Island: H. H. Chung 1609 (Ca—225555). Argentina: Burkart 18105 (N); Herb. Univ. Mass. s.n. [Aug. 1864] (Ms); T. Meyer 12620 (N); Moldenke & Moldenke 19723 (N). Arizona: A. R. Moldenke 620 (S). Austria: Khek s.n. [Aug. '72] (V—11289). Barbados: Herb. Bot. Stat. Barbados 322 (N). Bermuda: Brown & Britton 1728 (N);Brown, Britton, & Bisset 2209 (N). Brazil: Etzel s.n. [Prefeitura Municipal, July 26, 1937] (N, Sp—38719); W. Hoehne 2557 (Bh, N); Moldenke & Moldenke 19990 (N); Stellfeld 1095 [Herb. Mus. Paran. 1095] (N). California: Bailey & Bailey 7960 (Ba), 9743 (Ba); E. P. Bradbury s.n. [Letts Hollywood, 1916] (Ba); W. R. Dudley s.n. [July 1893] (Du—362568); Eastwood s.n. [Inverness, May 13, 1934] (Gg—214240); H. M. Hall 3819 (Ca—59951); P. L. Hall 63 (Ba); Lenington s.n. [Pomona, Dec. 15, 1927] (Hp), s.n. [Pomona, Feb. 16, 1928] (Hp); Woodcock 979 (Ba). Canada: Desrochers 416-52 (Mg), 417-52 (Mg), 418-52 (Mg), 419-52 (Mg), 591-52 (Mg), 592-52 (Mg), 625-52 (Mg), 736-52 (Mg); Herb. Marie-Victorin s.n. (Vi). China: Chiao 259 [Herb. Univ. Nanking 12028] (Bz—23750, Ca—294867); Herb. Inst. Bot. Acad. Sin. 459 [275] (S); Lauphit 113 (Ur); Liu s.n. [Peking Union Medical College] (Ba). Colombia: Daniel 2206 (W—1778707); H. García y Barriga 11619 (N, W—1854145); Toro Toro 1220 (Fn—1657). Congo Leopoldville: RR. PP. Salèsiens 291 (Br). Connecticut: Enequist 152 (N). Cuba: Fortún & Arias 7066 (Es); Herb. Est. Cent. Agron. s.n. [Nov. 1909] (Es); Ponce & Ramos 415 (Rg—317); Van Hermann 867, in part (N), 2688 (N, Po—63879). Delaware: Herb. Sullivant s.n. (Pa). El Salvador: Calderón 646 (W—1151628). Finland: Lindström 5 [1903] (Ew); Välli s.n. [5.8. 1936] (Vi). Florida: Bailey & Bailey 6468 (Ba), 7022 (Ba), s.n. [Tallahassee, Apr. 3] (Ba, Ba); G. B. Grant 2503a [10678] (Po); J. S. Watkins s.n. [Gainesville, 3-20-31] (Fl—21113). France: Bouchon s.n. [Duffour 5029] (Um—29); Herb. W. H. Harvey s.n. [h. R. P. 1837] (Du—166485); Herb. Saldanha 2769 (Ja—46559); E. H.

L. Krause 29280 (B). Georgia: Cuthbert s.n. [Augusta, June 1, 1900] (Fl—21114). Germany: Bothe s.n. [Juni 1903] (B, B); Golenz s.n. [Schwiebus, August 1872; Herb. Prager 18627] (Gg--31450), s.n. [Schwiebus, 1872] (B), s.n. [Schwiebus, Sept. '73] (B), s.n. [August] (Gg—31449), s.n. [Schwiebus] (La); Lohmeyer s.n. [chamaedrifolia var. hybrida] (B, B, Du), s.n. [teneroides] (Du); C. J. Mayer s.n. [München, Septbr. 1895] (Mi); Schulz & Schulz s.n. [Berlin, 13.9.1896] (B), s.n. [Berlin, 1.6.1897] (B). Hawaiian Islands: Neal s.n. [June 25, 1941] (Bi). Illinois: Herb. Div. Floric. Univ. Ill. 176 (Ur), 273 (Ur), 886 (Ur); Herb. Univ. Ill. s.n. [Oct. 1, 1870] (Ur); Stenstrom 4 (Ur, Ur). India: Herb. Hort. Bot. Calcutt. s.n. (Bz—23717, Bz--23787). Iowa: Harmon s.n. [Marshalltown, Oct. 7, 1929] (Io—133933). Italy: Gresino s.n. [29.V.1938] (N); Herb. Harvey s.n. [hort. Bellorae, jun. 1842] (Du—166458). Japan: Collector undesignated s.n. [17 Juni 1908] (W—1133064). Java: C. A. Backer 12523 (Bz--23786); Herb. Hort. Bot. Bogor. XVK.A.XLIV.5 (Bz—26425), XVK.A.XLIV.9 (Bz--26426), XVK.A.XLV.3 (Bz--23755), XVK.A.XLV.12 (Bz—23764), XVK.A.XLV.13 (Bz—26440, Bz), XVK.A.XLV.20 (Bz--26445), XVK.A.XLVI.19 (Bz—26470). Kansas: E. A. Popenoe s.n. [College Greenhouse, Apr. 5, 1901] (W—1114010). Louisiana: Langlois s.n. [August 1878] (I). Madeira: E. Wall 5 [27/329] (Ew). Massachusetts: L. H. Bailey s.n. [Cambridge, June 21-23, 1919] (Ba), s.n. [Cambridge, August 6-12, 1929] (Ba, Ba); Carr s.n. [Clinton] (Se—14942); A. Clark s.n. [Amherst, July 1876] (Ms); H. L. Jones s.n. [Oct. 1893] (Ob—50810); Kidder s.n. [7 Aug. 1929] (Oa—10740); Torrey & Cross s.n. [Oct. 3, 1936] (Ms, Ms). Mexico: Collector undesignated 1 (I), 59 (I); M. B. Foster s.n. [Veracruz] (Ba); Halbinger & Reko 312 (N); Moldenke & Moldenke 19824 (N). Mississippi: L. H. Bailey 7155 (Ba), 7156 (Ba). Netherlands: C. A. Backer s.n. [Apeldoorn, 1915] (Bz—23788). New Jersey: Disbrow s.n. [Newark] (Nm); H. N. Moldenke 3030 (N), 7858 (N). New Mexico: Arsène & Benedict 21573 (W—1696551). New York: L. H. Bailey s.n. [Sept. 1, 1915] (Ba), s.n. [July 4, 1919; Vilmorin-Andrieux 80070] (Ba, Ba), s.n. [Oct. 17, 1921] (Ba), s.n. [Sept. 4, 1922] (Ba), s.n. [Aug. 13, 1924; seed sown May 6; Ferry] (Ba), s.n. [Sept. 1, 1924] (Ba, Ba--photo, N--photo, Z--photo), s.n. [Sept. 12, 1924] (Ba), s.n. [Sept. 20, 1925; Haage & Schmidt 5203; seeds sown April 6] (Ba), s.n. [July 22, 1926; seed sown May 6; Steckler Seed Co.] (Ba), s.n. [July 22, 1926; seed sown May 6; Steckler 602] (Ba), s.n. [July 25, 1926; seed sown April 14] (Ba), s.n. [Sept. 8, 1926; Steckler E] (Ba), s.n. [Sept. 8, 1926; seed sown May 5; Steckler D] (Ba), s.n. [Aug. 31, 1927; Carter 5805; seed sown April 14] (Ba), s.n. [Nov. 1, 1927; Carter 5807; seed sown May 17] (Ba), s.

n. [July 29, 1928] (Ba, Ba--photo, Ba--photo, N--photo, N--photo, Z--photo, Z--photo), s.n. [Aug. 5, 1928] (Ba), s.n. [Sept. 25, 1928] (Ba); Burdick s.n. [July 2, 1923] (Ba); Collector undesignated s.n. [Tarrytown, Aug. 1, '96] (N); Herb. N. Y. Bot. Gard. s.n. [August 1, 1896] (N); Jacobi s.n. [N. Y. Bot. Gard. Cult. Plants 26575; 6/15/10] (N), s.n. [N. Y. Bot. Gard. Cult. Plants 26575; 7/8/10] (N), s.n. [N. Y. Bot. Gard. Cult. Plants 26575; 8/1/10; seed from Leiden] (N); H. N. Moldenke 8242 (N), 8243 (N), 8244 (N), 11894 (St), 11895 (St), 11897 (St); Moldenke & Moldenke 11887 (N), 11888 (N), 11893 (N), 11894 (N), 11895 (N), 11896 (N), 11897 (N), 11898 (N), 11899 (N), 11900 (N), 11901 (N); N. Y. Bot. Cult. Plants 11100 (N--photo); W. H. Rhoades s.n. [near Rochester, July 1938] (Hs); R. C. Schneider s.n. [N. Y. Bot. Gard. Cult. Plants 26575] (N); A. Wood s.n. (Pa). North Carolina: L. H. Bailey s.n. [Washington, May 17, 1930] (Ba); P. O. Schallert 17805 (Ok, Ok), s.n. [8/10/32] (Or--28433); M. W. Ward s.n. [Oct. 21, 1938] (Hi--5083); Ziegler s.n. [Oct. 16, 1938] (Hi--4069), s.n. [Oct. 18, 1938] (Hi--4064). North Dakota: St. Lawrence 494 (I). Ohio: E. Wilkinson s.n. [25 Sept. 1887] (Ob--80593). Oklahoma: O. H. Calvert 220 (St--24366); Murphy 99 (Ob--35109). Oregon: G. M. Powell s.n. [Aug. 8, 1933] (Or--42525). Panama: Maurice 896 (W--1791136). Pennsylvania: Burpee & Co. s.n. [Doylestown, Fordhook Famous] (Ba), s.n. [Doylestown, Scarlet Defiance] (Ba). Philippine Islands: M. S. Clemens 18431 (Ca--368058). Pitcairn Island: Fosberg & Christian 11199 (Bi). Puerto Rico: Britton & Boynton 8254 (N); Moldenke & Moldenke 19537 (N). St. Thomas: Britton & Britton 237 (N). St. Vincent: Morton 5457 (W--1884366). Sweden: Bagge s.n. [28/8/1910] (Go); Blom s.n. [Aug. 1931] (Go); Herb. Beurling s.n. [Holmiae, 1840] (S); Lindström 5 [1883] (Ew); Reuterman s.n. [31/7/1886] (Go), s.n. [13/9/1886] (Go); Trolander 5 (Ew); E. Wall 5 [18/844] (Ew, Ew), 5 [1/941] (Ew, Ew), 5 [15/941] (Ew). Switzerland: Herb. Hort. Bot. Basil. s.n. [Aug. 1841] (M), s.n. [Aug. 1839] (M), s.n. [1841] (M), s.n. (Mi). Texas: L. H. Bailey 7398 (Ba); C. L. Lundell 10936 (N, Rf), 10939 (N, Rf), 10940 (Sm); Lundell & Lundell 9763 (Ld, N); Reeves 190 (N). Uruguay: Herb. Herter 61714 (N); Rosengurtt B. 3428 (N). Venezuela: Bailey & Bailey 884 (Ba), 1865 (Ba); Elias 158 (Oa--13986). Vermont: Dole 346 (Vt); Loveland s.n. [Norwich, 3-22-92] (Vt). Locality of collection undetermined: Collector undesignated s.n. [1877] (Vt); Herb. Mazziari 1685 (S), 1687 (S), s.n. (S); Herb. Univ. Mass. s.n. [Oct. 1864] (Ms). MOUNTED ILLUSTRATIONS: Plate from garden catalogue (Z); Florist. & Hort. Journ. 3, no. 8. 1854 (N); Hort. Franç., sér. 2, pl. 18. 1865 (N); P. Henderson, Types of New Mammoth Verbena, fig. 1--15. 1888 (N);

Vick's Monthly, Verbenas (N); Verbenas 1. Shylock, 2. British Queen, 3. Exquisite (N); A. Blanc, Philad., Mammoth Verbenas, copyright 1888 (N); embossed color plate (N); Verbena Extra Choice Mixed 20 cts. (N); 25645. Verbena hybrida (N); Verbena. Packet, 20 Cents (N); No. 88. Verbena. $1.00 (N); 25660. Verbena hybrida, var. striata (N); 25661. Verbena hybrida, var. striata (N); 25662. Verbena hybrida, var. striata (N); Verbena. Garden Hybrids (N); Hybrid Garden Verbenas (N); Tom Thumb Verbena (N); 25665. Verbena hybrida, var. auriculaeflora (N); Verbena (N); Verbenas. Best of our General Collection (N); P. Henderson, New Verbena "Union" (N); No. 3097. New Verbenas. $1.25 (N); McAllister, Dwarf White Compact Verbena (N); McAllister, New Mammoth Verbena (N); A. Blanc, Types of Mammoth Verbenas (N); L. H. Bailey, Ithaca, Sept. 1, 1924 (N); L. H. Bailey, Ithaca, July 29, 1928 (N, N); New York Bot. Gard. Cult. Plants 11100 (N); No. 956, Verbena Hybrida Grandiflora Brightness (N); 4521, Henderson's American Beauty Collection of New Verbenas (N, N); 2802. Verbena All-color Giants (N, N, N); Hardy Verbena Brilliant (N); Verbena (N); 12. Verveine hybride à fleur d'auricule (N); 8015 Verbena (N); Verbenas Sutton's Giant Pink and Sutton's Giant Royal Blue (N); 2761 New Dwarf Erect Verbena Blue Sentinel (N); 8015 Verbena, New Giant Flowered Mixture (N); Schlings Nove Hy Collection of Improved Mammoth (Gigantea) Verbenas (N); 79906-79907 Verveine hybride variée extra (N); Vaughan's Seed Store, Vaughan's Best Verbenas (N); Verbena Spectrum Red (N); 2761. Blue Sentinel Verbena (N); Verbena (Hybrid) "Beauty of Oxford" (N); New Giant-Flowered Verbenas (N); New Verbena "Flamingo" (N); Attraction - A New Hardy Verbena (N); New York Bot. Gard. color slide 6073 (Z).

xVERBENA ILLICITA Moldenke, Revist. Sudam. Bot. 4: 18--19. 1937.

Synonymy: *Verbena urticaefolio-stricta* Engelm., Am. Journ. Sci. 46: 101. 1844. *Verbena stricto-urticaefolia* Engelm., Am. Journ. Sci. 46: 101. 1844. *Verbena stricta* x *urticaefolia* Mackenzie ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937 [not *V. stricta* x *urticaefolia* Eggert, 1958, nor Letterman, 1958, nor Pammel, 1958]. *Verbena stricta* x *urticaefolia* Pond ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. *Verbena stricta* x *urticifolia* Britton ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937 [not *V. stricta* x *urticifolia* Glatfelter, 1958, nor Patterson, 1958]. *Verbena stricta* x *urticifolia* Eggert ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. *Verbena stricta* x *urticifolia* Stevens (in part) ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. *Verbena urticifolia* x *stricta* Eggert ex Moldenke, Revist. Sudam. Bot. 4: 19, in syn. 1937. *Verbena stricta* x *urticifolia* Gates, Fl. Kans. 191. 1940. *Verbena hastata* x *urticifolia* Gates, Fl. Kans. 190. 1940[not *V. hastata* x *urticifolia* Blanchard, 1937, nor Dermen, 1936, nor Eggert, 1937, nor Farwell, 1947, nor Perry, 1941, nor Pringle, 1947]. *Verbena stricta* x *urticifolia* Schneck ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena stricta x urticaefolia Gates ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena stricta x urticifolia Bush ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena urticifolia x stricta Gates (in part) ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena urticifolia x stricta Norton ex Moldenke, Am. Midl. Nat. 59: 352, in syn. 1958. Verbena stricto-urticifolia Patterson ex Moldenke, Résumé 375, in syn. 1959. Verbena stricta urticifolia Gates ex Moldenke, Résumé 375, in syn. 1959.

Bibliography: Engelm., Am. Journ. Sci. 46: 101. 1844; Moldenke, Revist. Sudam. Bot. 4: 18—19. 1937; Gates, Fl. Kans. 191. 1940; Moldenke, Prelim. Alph. List Invalid Names 48 & 49. 1940; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Alph. List Invalid Names 50 & 51. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 6—11 & 101. 1942; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 54: 95. 1945; Moldenke, Bot. Gaz. 106: 160. 1945; G. N. Jones, Fl. Ill. [Am. Midl. Nat. Monog. 2:] 216. 1945; Moldenke, Castanea 10: 38. 1945; Moldenke, Alph. List Cit. 1: 81, 108, 110, 159, 164, 181, 193, & 279. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 27. 1947; Moldenke, Phytologia 2: 326. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Alph. List Cit. 2: 395, 396, 399, 470, 516, & 524 (1948), 3: 699, 721, 773, 774, 790, 791, 800, 822, 826, & 904 (1949), and 4: 1217, 1255, 1261, & 1298. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 12, 13, 15—18, 21, & 198. 1949; Moldenke, Phytologia 3: 72 (1949) and 4: 67. 1952; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 126, 129, & 130. 1952; Moldenke, Phytologia 4: 185. 1953; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 2, 3: 126, 129, & 130. 1958; Moldenke, Am. Midl. Nat. 59: 347 & 362—353. 1958; Moldenke, Résumé 16, 17, 19, 21, 22, 26, 365, 375, 377, & 472. 1959; Moldenke, Résumé Suppl. 2: 2 (1960) and 3: 6 & 41. 1962; J. D. Poindexter, Trans. Kans. Acad. Sci. 65: 410, 415, 417, & 418. 1962; Moldenke, Résumé Suppl. 6: 1 & 2 (1963) and 7: 2 & 10. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963.

Illustrations: Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 130 (1952) and print. 2, 3: 130. 1958.

This is a natural hybrid between V. stricta Vent. and V. urticifolia L., occurring commonly where the ranges of the two species overlap in the central United States. It is based on the V. urticaefolio-stricta of Engelmann, of which the type was collected by George Engelmann at Saint Louis, Missouri, in September of 1841. It resembles V. urticifolia in habit, but has the spikes denser, not greatly elongated after anthesis, very sparsely and irregularly fruited, the mature calyxes mostly contiguous, the flowers larger, the leaves broader, and the stems, branches, inflorescences, and leaves densely and coarsely long-pubescent. The corollas are described as blue.

Poindexter (1962) compares this hybrid with its two parents as follows: Leaf index: V. urticifolia = 1.9—2.6 (average 2.2), xV.

illicita = 2.1--2.7 (average 2.2), V. stricta = 1.3--2.1 (average 1.8); leaf-shape: V. urticifolia = broadly lanceolate to ovate, xV. illicita = ovate to broadly lanceolate, V. stricta = elliptic to ovate; leaf-base: V. urticifolia = rounded, decurrent into the petiole, xV. illicita = sharply attenuate to sessile, V. stricta = broadly attenuate to sessile; leaf-apex: V. urticifolia = gradually acuminate, xV. illicita = gradually to abruptly acuminate, V. stricta = acute to rounded; stem pubescence: V. urticifolia = hirtellous, xV. illicita = hirtellous to hirsute, V. stricta = hirsute; nutlet length: V. urticifolia = 1.6--1.9 (average 1.7), xV. illicita = 1.6--2.4 (average 2.2), V. stricta = 2.2--2.9 (average 2.6); markings on back of nutlets: V. urticifolia = moderately ribbed, xV. illicita = moderately to densely ribbed, V. stricta = deeply ribbed; pollen fertility: V. urticifolia = 83--99 percent (average 94.2 percent), xV. illicita = 19--64 percent (average 34.7 percent), V. stricta = 50--100 percent (average 90 percent); corolla-tube length: V. urticifolia = 1.5--2.5 (average 2.1), xV. illicita = 3.4--4.5 (average 4), V. stricta = 4.5--5.5 (average 4.9); calyx length: V. urticifolia = 1.7--2.3 (average 2), xV. illicita = 2--4.5 (average 3.2), V. stricta = 3.8--5.1 (average 4.3); petiole-lateral vein measurement: V. urticifolia = 14--25 (average 19.6), xV. illicita = 3--15 (average 9.7), V. stricta = 3--6 (average 3.8).

Storm reports the hybrid as "not numerous", growing among V. stricta Vent., V. hastata L., and V. urticifolia L. Pammel refers to it as "a common weed" (but probably is referring here to the true V. urticifolia with which he has mixed it on herbarium sheets) in sandy clay soil, associated with V. stricta, V. hastata, Anthemis cotula L., Persicaria mitis Gilib., Ambrosia elatior L., and Coreopsis palmata Nutt. Other collectors have found it in wet or sandy soil, pastures, meadows, waste places, and river-bottoms, at the edge of swamps, and along dry roadsides and streets, flowering from May to September, and in fruit from June to September. Ahles found it in a pasture with V. stricta, V. hastata, and V. urticifolia, while Ahles & Gilpin collected it in waste ground of low areas and in thinly wooded pastures with both parents present. Demaree found it at an elevation of 450 feet.

Herbarium material of this hybrid has been misidentified and distributed as V. bracteosa x stricta Palmer, V. hastata L., V. stricta Vent., V. stricto-paniculata Engelm., V. urticifolia L., and V. urticifolia x hastata Gates. On the other hand, the G. W. Stevens 2308, distributed as this hybrid, is V. hastata L., and Wills s.n. [July 27, 1959] is V. urticifolia L. The hybrid has been called "blue vervain".

Engelmann's V. stricto-urticaefolia was based on a collection made by him at Saint Louis, Missouri, in July, 1842, and one by

Carl Andreas Geyer at Beardstown, Cass County, Illinois, in July, 1842. The type of V. hastata x urticifolia Gates was collected by John Bitting Smith Norton (no. 792, in part) in Riley County, Kansas, and is deposited in the herbarium of the Kansas State College at Manhattan (although in his original publication Gates says for it "scattered, Meade, Crawford, and Bourbon Counties"); that of V. urticifolia x stricta Norton was gathered by the same collector in Pottawatomie County, Kansas, on July 17, 1896, deposited in the same herbarium; that of V. stricta urticifolia Gates is a collection by George Lemon Clothier and Harry Nichols Whitford from Labette County, Kansas, on August 18, 1897, also in the same herbarium. V. stricta x urticifolia Eggert is based on a collection by Heinrich Karl Daniel Eggert from somewhere in Illinois, August 14, 1875, deposited in the herbarium of the New York State Museum at Albany, while his V. urticifolia x stricta was collected by him on August 3, 1875, at Cairo, Alexander County, Illinois, deposited at Iowa State College. The type of V. stricta x urticaefolia Pond was collected by Raymond Haines Pond (no. 1130) in Pottawatomie County, Kansas, deposited in the herbarium of the University of Michigan, that of V. stricto-urticifolia Patterson was collected by Henry Norton Patterson in July 1872 in Henderson County, Illinois, deposited at the New York State Museum, and that of V. stricta x urticifolia Bush was gathered by Benjamin Franklin Bush (no. 12927) in Morgan County, Missouri, and is deposited in the herbarium of the University of Oklahoma at Norman. It should be noted here that V. stricta x urticifolia Gates is in part typical V. urticifolia L.

The V. stricta x urticaefolia Eggert referred to in the synonymy above is a synonym of xV. rydbergii Moldenke, as are also the V. stricta x urticifolia of Glatfelter and of Patterson. The V. stricta x urticaefolia of Letterman and of Pammel are xV. moechina, while the V. hastata x urticifolia of Blanchard, of Fermen, of Eggert, of Farwell, of Perry, and of Pringle are all xV. engelmannii. The V. stricta x urticifolia Stevens referred to above "in part" as xV. illicita, is also in part xV. perriana Moldenke and xV. rydbergii, while the V. urticifolia x stricta Gates is in part also V. urticifolia L.

Pammel says of McKibben s.n. [Steam Boat Rock, Sept. 1912] "Is this a hybrid? Found in sandy soil. Nearly all the plants of this type." The M. K. Clemens s.n. [Oshkosh, July 30, 1909], cited below, was annotated by Perry in 1932 as "cf. Verbena hastata L."

In all, 63 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: ILLINOIS: Alexander Co.: Eggert s.n. [Cairo, Aug. 3, 1875] (Ca—181599, Cm, Io—79870, N, W—754561), s.n. [3.8.75] (Go). Cass Co.: Geyer s.n. [Beardstown, July 1842] (Br, Dt). Fulton Co.: Winterringer 8834 (Il—38702). Hancock Co.: L. H. Pammel s.n. [Hamilton, Sept. 8, 1918] (Io—94060). Henderson Co.: H. N. Patterson s.n. [July 1872] (Al). Kankakee Co.: C. C. Crampton 369 (W—750627). Mason Co.: Ahles 2985 (Ur). Menard Co.: E. Hall s.n. [Athens, 1861] (Pa). Piatt Co.: Ahles 6578 (Ur); G. N. Jones 20849 (Ur). Randolph Co.: Ahles & Gilpin 8143 (Ur). Sangamon Co.: Ahles 4589 (Ur). Vermilion Co.: Ahles & Gilpin 8091 (Ur); Storm s.n. [July 28, 1949] (Ur). Wabash Co.: Schneck s.n. [streets of Mt. Carmel, June 25, 1879] (Ur). Whiteside Co.: Ahles 4202 (Ur). County undetermined: Eggert s.n. [14 Aug. 1875] (I). INDIANA: Tippecanoe Co.: Dorner 120 (Pu), 313 (Pu). IOWA: Des Moines Co.: L. H. Pammel 960, in part (Io—119554). Hardin Co.: McKibben s.n. [Steam Boat Rock, Sept. 1912] (Io—123449). WISCONSIN: Winnebago Co.: M. K. Clemens s.n. [Oshkosh, July 30, 1909] (Po—69913). KANSAS: Doniphan Co.: Agrelius, Hall, Lovejoy, & Maroney s.n. [8-18-13] (Lw). Labette Co.: Clothier & Whitford s.n. [Aug. 18, 1897] (Ka). Pottawatomie Co.: J. B. S. Norton s.n. [7-17-96] (Ka); R. H. Pond 1130 (Ka, Ka, Mi, N, W—353933). Riley Co.: J. B. S. Norton 792, in part (Ka). Wabaunsee Co.: Norton & Clothier s.n. [7-3-1895] (Ka). Wyandotte Co.: K. K. Mackenzie s.n. [June 27, 1895] (N). MISSOURI: Cooper Co.: B. F. Bush 12548 (Bt—15403). Franklin Co.: Eggert s.n. [Pacific, 4 July 1896] (Cm, N). Jasper Co.: E. J. Palmer 4025 (W—753613). Morgan Co.: B. F. Bush 12927 (Ok—14686). Ralls Co.: J. Davis s.n. [July 17, 1913] (Se—14948). Saint Louis: Eggert 5319 (N), s.n. [St. Louis, 14 Aug. 1875] (Al, Cm, Tl); Engelmann s.n. [St. Louis, Sept. 1841] (Pr—isotype, W—71970—isotype, W—71972—isotype, W—71995—isotype), s.n. [St. Louis, July 1842] (Pr, T), s.n. [St. Louis, Aug. 1848] (T), s.n. [St. Louis, Aug. 1859] (T, T), s.n. [St. Louis] (Br, Sg—16104). ARKANSAS: Baxter Co.: Demaree 20686 (N, Z). Benton Co.: Plank s.n. (N). NEBRASKA: Nemaha Co.: J. L. Sheldon s.n. [Peru, July 18, 1900] (We).

VERBENA INAMOENA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1058. 1904.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1058. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 480. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 101 (1942) and [ed. 2], 99 & 198. 1949; Moldenke, Phytologia 3: 305 (1950) and 3: 453 & 454. 1951; Moldenke, Résumé 118 & 472. 1959.

Tall herb, 0.8—1.5 m. tall; stems erect, conspicuously tetragonal, dark-green, shortly pilose-pubescent and rough throughout, ramose; branches ascending; principal internodes 3—5 cm. long; leaves sessile, decussate-opposite, reflexed, elongate, rather thick-textured, narrowly oblong-lanceolate, 8—9 cm. long, 1—1.4 cm. wide, acute or subacute at the apex and rather long-apiculate, the margins subparallel or slightly convex, irregularly and rather strongly serrate-crenate, auriculate at the base and clasping the stem so as to hide it completely, giving a perfoliate appearance, rugose, rough or scabridulous on both surfaces and also pilose-pubescent, dark-green, prominently reticulate-nervose, the teeth 1—2 mm. long and 2--5 mm. apart; peduncles elongate, naked, shortly pilose-pubescent, the hairs mixed with stipitate glands; spikes terminal, subsessile, very short, arranged in dense corymbs at the apex of the peduncle, 5—8 mm. long (excluding the corollas); bractlets shorter than the calyx or subequaling it, elliptic, 2.5—2.8 mm. long, subobtuse at the apex, shortly pubescent on the back, rather stiffly pilose-ciliate along the margins; calyx short-tubular, about 3 mm. long, glabrescent, rather shortly pilose-ciliate toward the apex and on the angles, the teeth short-acuminate from a broad base, less than 0.5 mm. long; corolla rose, medium-sized, its tube long-exserted, surpassing the calyx-teeth by about 5 mm., rather densely pilose-pubescent and interspersed with stipitate glands on the outer surface, the limb spreading, 4--5 mm. wide, the lobes obcordate, subglabrous on the inner surface, the largest about 2 mm. long and 2.5 mm. wide; stamens and pistil included.

The type of this little-known species was collected by Emil Hassler (*no. 3164*) on the campo near Tobaty, Paraguay, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Briquet notes that "Cette curieuse espèce se place dans le voisinage du *V. bonariensis*, dont elle se distingue par ses feuilles étroites et très allongées, réfléchies, ses épis très courts groupés en une inflorescence corymbiforme dense, et ses bractées elliptiques, subobtuses au sommet (lancéolées-acuminées dans le *V. bonariensis*)."

Thus far the species *is known only* from the type specimen, not as yet seen by me.

VERBENA INCISA Hook. in Curtis, Bot. Mag. 65: pl. 3628. 1839 [not *V. incisa* Chod., 1904].

Synonymy: ?*Verbena arranana* J. Harrison, Floricult. Cab. 6: 47. 1838. ?*Verbena tweedieana* var. *arraniana* Niven ex Maund & Henslow, Botanist 2: pl. 60, in textu. 1838. *Verbena triumphans* Marnock, Floricult. Mag. 5: 87—88, pl. 54, fig. 1. 1840. *Verbena arraniana* Hort. ex Steud., Nom. Bot., ed. 2, 749. 1841. *Verbena arranaeana* Hort. ex Schau. in Mart., Fl. Bras. 9: 183, in syn. 1851. *Verbena triumphans* Hort. ex Stapf, Ind. Lond. 6: 431. 1931. *Verbena tweediana arraniana* Niven ex Stapf, Ind. Lond. 6: 431. 1931. *Verbena fulgens* Bonpl. ex Moldenke, Lilloa 6: 331, in syn. 1941. *Verbena incisa* Hort. ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947. *Verbena tweediana* var. *arraniana* Niven ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. *Verbena arraiana* Hort. ex Moldenke in Chittenden, Roy. Hort. Soc.

Dict. Gard. 4: 2210, sphalm. 1951. *Verbena briquetiana* Osten ex Moldenke, Résumé 360, in syn. 1959. *Verbena briquetiana* f. *campestris* Osten ex Moldenke, Résumé 360, in syn. 1959. *Verbena briquetiana* f. *silvatica* Osten ex Moldenke, Résumé 360, in syn. 1959. *Verbena chamaedryfolia* α *melindres* f. *siccanea* Osten ex Moldenke, Résumé 362, in syn. 1959. *Verbena chamaedryfolia hybrida* Osten ex Moldenke, Résumé 362, in syn. 1959. *Verbena megapotamica* var. *truncatula* Briq. ex Moldenke, Résumé 369, in syn. 1959. *Verbena melindroides* f. *briquetiana* Osten ex Moldenke, Résumé 369, in syn. 1959. *Verbena melindroides* f. *silvatica* Osten ex Moldenke, Résumé 370, in syn. 1959. *Verbena megapotamica* f. *truncatula* Briq. ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. *Verbena tweediana* var. *grandiflora* Martens ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962.

Bibliography: J. Harrison, Floricult. Cab. 6: 47. 1838; Maund & Henslow, Botanist 2: pl. 60. 1838; Marnock, Floricult. Mag. 2: 184, pl. 24, fig. 1. 1838; Hook. in Curtis, Bot. Mag. 65: pl. 3628. 1839; G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839; Meisn., Pl. Vasc. Gen. 2: 198. 1839; Maund, Bot. Gard. 7: pl. 167. 1839--1851; Marmock, Floricult. Mag. 5: 87--88, pl. 54, fig. 1. 1840; Gard. Chron. 1841: 730. 1841; Steud., Nom. Bot., ed. 2, 749. 1841; Walp., Repert. Bot. Syst. 4: 32 & 33. 1845; Schau. in A. DC., Prodr. 11: 538. 1847; Schau. in Mart., Fl. Bras. 9: 183. 1851; Vilm., Fleurs Pleine Terre, ed. 1, 939. 1865; Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1263. 1873; Regel, Gartenfl. 28: 372. 1879; Ball, Journ. Linn. Soc. Lond. Bot. 21: 231. 1884; Nicholson, Illustr. Dict. Gard. 4: 145. 1887; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 197. 1892; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147. 1894; L. H. Bailey in A. Gray, Field Forest & Gard. Bot. 341. 1895; Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; L. H. Bailey, Cycl. Amer. Hort., ed. 1, 6: 1912, pl. 2649. 1902; Chod., Bull. Herb. Boiss., sér. 2, 2: 818. 1902; Ed. Rodigas, Bull. Arboricult. Belg. 1902: 114. 1902; Chod., Plant. Hassler. 9: 197. 1902; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 288. 1904; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1061--1062. 1904; Briq., Arkiv Bot. Stockh. 2 (10): 10--12. 1904; L. H. Bailey, Cycl. Amer. Hort., ed. 4, 6: 1912, pl. 2649. 1906; Gerth van Wijk, Dict. Plantnames 1397--1398. 1911; L. H. Bailey, Stand. Cycl. Hort. 6: 3445, pl. 3910. 1917; C. L. Pollard in Webster's New Internat. Dict. Eng. Lang. 2275. 1917; Herter, Florul. Urug. 105. 1930; Stapf, Ind. Lond. 6: 430 & 431. 1931; Parodi, Rev. Argent. Agron. 1: 202. 1934; L. H. & E. Z. Bailey, Hortus, new rev. ed., 632. 1935; Ciferri, Atti Inst. Bot. Univ. Pavia, ser. 4, 8: 280 & 284. 1936; Troncoso, Darwiniana 3: 53 & 55. 1937; Moldenke, Alph. List Common Names 25 & 32. 1939; Beale, Chron. Bot. 5: 517. 1939; Moldenke, Prelim. Alph. List Invalid Names 46. 1940; Beale, Journ. Genet. 40: 338, 340, 348, 354, & 355. 1940; Moldenke, Lilloa 6: 331--332 (1941) and 8: 430--431. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 31, 39, 41, 44, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 48.

1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 21. 1942; Moldenke, Lilloa 10: 385. 1944; Moldenke, Phytologia 2: 79 & 115. 1945; Augusto, Fl. Rio Grande do Sul 209 & 232. 1946; Moldenke, Alph. List Cit. 1: 12, 22, 47, 212, & 262. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 25. 1947; Moldenke, Phytologia 2: 348 (1947) and 2: 425. 1948; Moldenke, Castanea 13: 117 & 119. 1948; Moldenke, Alph. List Cit. 2: 356, 360, 370, 374, 378, 413, 426, 441, 481, 533, 535, 575, 586, 598, & 599 (1948), 3: 703, 731, 732, 748, 749, 780, 859, 860, 875, 893, 909, 913, & 966 (1949), and 4: 1077, 1080, 1088, 1089, 1091, 1092, 1100, 1164, 1172, 1207, 1233, 1237, 1283, & 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 98—100, 106, 164, & 198. 1949; Moldenke, Phytologia 3: 135 (1949), 3: 288 (1950), and 3: 467. 1951; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2208, 2209, & 2211. 1951; Moldenke in Humbert, Fl. Madag. 174: 8. 1956; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Am. Midl. Nat. 59: 350 & 362. 1958; Moldenke, Résumé 110, 115, 118, 119, 127, 223, 367, 369, 370, 377, 421, & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Moldenke, Résumé Suppl. 3: 29 & 36—41 (1962), 4: 19 (1962), 5: 2 (1962), and 6: 10 & 11. 1963.

Illustrations: J. Harrison, Floricult. Cab. 6: 47 [in color]. 1838; Marnock, Floricult.Mag. 2: pl. 24, fig. 1 [in color]. 1838; Maund & Henslow, Botanist 2: pl. 60 [in color]. 1838; Hook. in Curtis, Bot. Mag. 65: pl. 3628 [in color]. 1839; Maund, Bot. Gard. 7: pl. 167 [in color]. 1839—1851; Marnock, Floricult. Mag. 5: pl. 54, fig. 1 [in color]. 1840; Nicholson, Illustr. Dict. Gard. 4: 145. 1887; L. H. Bailey, Cycl. Amer. Hort., ed. 1, 6: 1912, pl. 2649 (1902) and ed. 4, 6: 1912, pl. 2649. 1906; L. H. Bailey, Standl. Cycl. Hort. 6: 3445, pl. 3910. 1917.

Usually prostrate or creeping perennial herb, often spreading 1 or 2 m., sometimes subscandent, occasionally suffrutescent at the base and erect, 2.5 dm. to 2 m. tall, hirsute-pubescent and subcanescent throughout; stems usually procumbent or ascending, often twisting, usually about 6 dm. long; branches erect, whitish-hairy; leaves decussate-opposite, the lower ones petiolate, to 5 cm. long and 2.5 cm. wide at the base; petioles to 13 mm. long; leaf-blades thin-textured, oblong-ovate or triangular (the uppermost ones usually sessile, lanceolate or sublanceolate, and incised-pinnatifid), coarsely incised-serrate or pinnatifid-lobed, sharply acute at the apex, truncate or subcordate to auriculate at the base and there cuneately attenuate into the petiole, lineate-rugose above, appressed-strigillose or short-strigose with whitish hairs on both surfaces; spikes terminal, pedunculate, often ternate or subternate or in a corymbose panicle at the tips of the branches, densely many-flowered, at first fascicle-like, later elongating; bractlets ovate, 1/4 to 1/3 as long as the calyx, densely whitish-pubescent; flowers very showy; calyx tubular, about 10 mm. long, densely white-pubescent or -hirtellous on the outside, with scattered stipitate glands, the rim with short acuminate teeth; corolla hypocrateriform, usually red, clear-red, dark-red, blood-red, bright-red, fire-red, or vivid-red to cinnabar-red, scarlet, brilliant scarlet, crimson, or bright crimson [other colors are reported, see below], its tube about 15 mm. long, glandular-pubescent, about 3 times as long as the calyx, the limb large, 7--9 mm. wide, the lobes obovate, deeply emarginate at the apex.

This rather perplexing but common species was based on two collections of James Tweedie (*nos. 504* and *505*) from "Alacriporium", Rio Grande do Sul, Brazil. The collector was cited as "Tweed" by Schauer in 1847, but this error was corrected by him in his 1851 work. The same author cites also *Tweedie 460* "in campis siccis civitt. Platensium, ad S. Fé juxta flum. Parana."

It seems that the earliest name proposed for this species may possibly be *Verbena arranana*. The article in which this name is proposed is unsigned. I assume that Joseph Harrison, editor of the journal, was the author, but this is just an assumption based on a memorandum from Dr. H. W. Rickett wherein he cites Gard. Chron. 1841: 730 as authority. Steudel later "corrected" the spelling of the specific epithet to "*arraniana*" and credited it merely to horticultural origin. Other authors credit it to Niven. Maund & Henslow (1838) say "This variety, which Mr. Niven has termed *Arraniana*......seeds sent by Mr. Tweedie, in 1834, to Mr. Niven, of the Glasnevin Botanic Garden, Dublin, by whom a single plant was raised." They call it "Mr. Tweedie's Vervain, Purplish-flowered variety", but *V. incisa* does NOT have purple flowers. This casts doubt on the disposition of *V. arranana* here -- it may belong in the synonymy of *V. phlogiflora* Cham. instead. The original article states that "Mr Tweedie sent seeds of this very fine species from Buenos Ayres to the Edinburgh and Dublin Botanic Gardens. The plant has bloomed at the latter place, from whence we secured our drawing. It is said to be more shrubby than the lovely *V. tweediana*, and where grown in contrast with the other species, will have a pretty effect. It has been named in compliment to the Earl of Arran."

Walpers (1845) classifies *V. incisa* in his Section *Verbenaca*, Subsection *Inermes*, Group *Foliosae*, Subgroup *Macranthae*, and Secondary Subgroup *Aubletia*, along with ten other species. Schauer (1847) placed it in Section *Verbenaca*, Subsection *Nobiles*, with 6 other species. He points out that it is closely related to *V. phlogiflora* Cham. "sed foliorum figurâ, corollae roseo-purpurascentis tubo glanduloso-pubescente breviore calycem triente excedente, hirsutie subcanescente distincta." His description of the corollas as being rose-purple is of great interest. Most of the specimens cited below are described as having the corollas some shade of red, crimson, or scarlet, which seems to be typical. However, on *Osten 2977* they are said to be "orange", on *Bailey & Bailey 1234* "pink", on *Herb. Osten 13572*, *Schreiter 5151*, and *Anisits 1978* "rose", on *T. Meyer 277* "pale rose", on *Lillo 6181* "purple", and on *Herter 84432*, *Rojas 11785*, and *Ruiz Huidobro*

3565 "violet". I am not convinced that these collections are true *Verbena incisa* — they may represent hybrids with other species - although Eyerdam & Beetle on the label of their *no. 22954* say that the flowers of *V. incisa* show a "large range of color variation, pink, purple, scarlet, dark red, lavender, etc."

Briquet (1904) gives the following characters for *V. incisa*: "les inflorescences.....non pas en capitules corymbiformes...les bractées ovées, quatre fois plus courtes que le calice....les dents calicinales.....courtes et simplement acuminées....la corolle deux à trois fois plus grande [than in *V. tomophylla*], à limbe étalé mesurant 1,5 cm. de diamètre, et glanduleuse extérieurement."

Osten, in a memorandum written in Montevideo and dated January, 1931, says "Zu Herb. C. Osten No. 8046. *Verbena 'Briquetiana'*. Cf. Briquet Verbenaceae Balansanae in Annulaire du Conserv. de Genève 1903/04 (VII-VIII) p. 288. 1904. Cf. Briquet in Arkiv f. Botanik II no. 10. 1904. Die Arbeiten von Chodat (Plantae Hasslerianae) und Briquet so weit sie die Sectio '*Nobiles*' Schauer betreffen, sind voll von Irrthumern. Ich habe Briquet von 2 Jahren eine grossere Sammlung von Verbenen gesandt mit meinen Bemerkungen, habe aber nicht einmal Empfangsanzeige erhalten. An Hassler sandte ebenfalls, habe von ihm schriftlich die Nachricht, dass er mit meinen Ansichten übereinstimmt (Hassler ist augenblicklich in San Bernardino, ich habe ihn leider nicht sehen können).

"Briquet behauptet, dass *V. chamaedryfolia* in Paraguay nicht vorkomme. Das ist richtig soweit es sich um *V. Melindres* Gill. handelt. *V. melindroides* Cham. habe ich von Misiones und dürfte sie am Alto Paraná jedenfalls auch in Paraguay vorkommen. Wenn man aber die rotblühenden Formen der *Nobiles* zu einer sp. coll. (turma, grex) *V. chamaedr.* zusammenfasst, so gehört diese Form 8046 jedenfalls dazu. Ich habe hier in Uruguay, in Paraguay, in Argentinien gefunden dass die Blütenfarbe der einzelnen Arten sehr constant ist, dass dieselbe Art rot, violett, weiss blüht, ist absolut ausgeschlossen (cf. Chodat in Plant. Hassl.!). Soweit ich aus dem Beschreibungen Briquet's ersehen kann, hat er diese Form zu *phlogiflora* (*megapotamica* var. *Tweediana*) als forma *truncatula* gezogen. Sie hat *nichts damit zu tun*. *V. phlogiflora* ist hochwüchsiger, mit grösseren Blüten deren Farbe *immer lila violett* ist, deren Blütenstande sich nach dem Verblühen *nicht* verlängern sondern kopfförmig bleiben. Ich habe diese Form 8046 in meinem Herbar als '*Briquetiana*' bezeichnet und halte sie für den Uebergang von *V. incisa* Hook. zu der *V. scrobiculata* Griseb. (Symbolae no. 1735). *V. incisa* Hook. aus der Araucariazone, s/Br. Uruguay [nur fluss littoral!]; *V. scrobiculata* = Tucumanzone, 'Alles flüsst!"

It should be noted here that *Verbena incisa* Chod. is actually a synonym of *V. tomophylla* Briq. The type of *V. fulgens* is a specimen collected by Aimé Jacques Alexandre Bonpland in Corrientes, Argentina, and deposited in the Bonpland Herbarium at the Botanisches Museum in Berlin. The type of *V. incisa* Hort. is *Herb. Martius s.n.*, collected, presumably by Carl Friedrich Philipp von Martius, from a cultivated plant in the Munich Botanical Garden and deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels, with a note on the label that it is perhaps a hybrid with *V. teucrioides*. The type of *V. chamaedryfolia* α *melindres* f. *siccanea* was collected by Cornelius Osten (*no. 10612*) at La Falda, at an altitude of 1000 meters, in the Sierra Chica, on April 22, 1917, and is deposited at the Museo de Historia Natural at Montevideo. The type of *V. megapotamica* f. *truncatula* was collected by Emil Hassler (*no. 567*) on a campo at Guazue, Paraguay, in July, while that of var. *truncatula* was gathered by Carl Axel Magnus Lindman (*no. A.3901*) at Paraguarí, Paraguay, in October, 1893, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The latter was erroneously listed by me (1959) as a synonym of *V. scrobiculata*, but this is not true unless Osten is correct in his interpretation of that species as being the common Tucumán plant -- an opinion which I accepted when I first examined and identified the Tucumán material, but to which I do not now hold.

The type of *V. briquetiana* and of its f. *campestris* is apparently *Osten 8046* from along a roadside at San Bernardino, Paraguay, collected on August 18, 1915, and deposited at the Naturhistoriska Riksmuseum in Stockholm, while that of *V. briquetiana* f. *silvatica* and of *V. melindroides* f. *briquetiana* is *Osten 9017* from shady places at San Bernardino, collected on August 11, 1916, and deposited in the same herbarium. All of these names were erroneously referred by me to *V. scrobiculata* in my 1959 work. Osten's *V. briquetiana* x *tenuisecta* Briq. is discussed by me under the name x*Verbena trinitensis* Moldenke, which see.

Bailey & Bailey 925 and *925b* are typical *V. incisa*, but *no. 925a* -- "runners and flowers from one plant, scarlet, colonized along railroad" -- is doubtfully this. Presumably, however, all were collected at the same spot. *R. E. Fries 557* may be a hybrid with *V. peruviana* -- its leaves are very small, and the collector describes the flowers as red inside and pink outside and says that the plant is very rare in hard dry open places.

In Lilloa 6: 331 (1941), as well as in my Prelim. Alph. List Invalid Names 46 (1940) and Alph. List Invalid Names 48 (1942), *V. incisa* lus. *albiflora* Osten is given as a synonym of *V. incisa*, and *A. G. Schulz 1478* is cited, but these are now regarded by me as *V. incisa* f. *albiflora* Osten & Moldenke, which see. Morong, Britton, & Vail (1892) cite *Morong 51* as *V. peruviana* (L.) Britton.

It should be noted here that the name, *Verbena incisa*, apparently should be accredited to Marnock who first published it with a color plate, not there credited to Hooker or anyone else, in 1838. It is also very possible that the proper name for this taxon is V. peruviana (L.) Britton, a name based on Lychnidaea, veronicae folio, flore coccineo Feuill. (1725), to which Linnaeus in 1753 merely added a Latin descriptive sentence and the binomial, Erinus peruvianus. Feuillée's type was collected on the north bank of the La Plata River in Paraguay (not in Peru) and his description points to V. incisa rather than to the taxon now passing as V. peruviana. I hesitate, however, to make this change without having actually seen Feuillée's specimen. If this change were made, then what is now passing as V. incisa Hook. would become V. perüviana (L.) Britton, and what is now passing under the latter name would become V. chamaedryfolia A. L. Juss.

Numerous vernacular and common names have been recorded for V. incisa, including "camaradinha", "cut-leaved verbena", "cut-leaved vervain", "eingeschnittenblättrige Verbene", "jurujuba", "margarita", "margarita del campo", "margarita peztá", "margarita punzo", "margarita punzó", "margarita roja", "Mr. Bunney's triumphant vervain", "pubbeeten", "scarlet verbena", "verbena roja", "verbenen", and "verveine à feuilles incisées".

Herbarium material of this species has been widely misidentified and distributed under such names as V. chamaedrifolia Juss., V. chamaedrifolia L., "V. chamaedrifolia var. nov.", V. chamaedryfolia Juss., V. chamaedrifolia var. melindroides Schau., V. chamaedryfolia α melindres (Gill.) Schau., "V. chamaedryfolia forma" (by Hassler and by Osten), V. hassleriana Briq., V. marrubioides Cham., V. megapotamica Spreng., V. megapotamica var. tweediana (Niven) Kuntze, V. melindroides Cham., V. montevidensis Spreng., V. peruviana (L.) Britton, V. peruviana R. & P., V. platensis Spreng., V. scrobiculata Griseb., V. tenuisecta Briq., V. tweediana Hook., and even Lippia nodiflora (L.) Rich. Osten annotated Rojas 3395 as "V. chamaedryfolia Juss. hybrida?", while on Jacinta s.n. [Herb. Osten 7079] he says "V. chamaedryfolia Juss. ad melindroidem vergens."

On the other hand, the Herb. Hort. Bot. Basil. s.n. [Aug. 1839] and the J. K. Small 8745, distributed in herbaria as V. incisa, are actually xV. hybrida Voss, Ekman H.12615 is V. tenuisecta Briq., and the Jörgensen 2636 cited in my Alph. List Cit. 2: 599 (1948), Herb. Osten 14552, and Herb. Inst. Miguel Lillo 31373 are V. tomophylla Briq. Beale (1940) regards V. incisa as a variety of V. phlogiflora.

Verbena incisa has been collected along roadsides, streets, and highways, in woods and wet meadows, rather moist woods, fields, dry fields, and pastures, in cultivated and sandy cultivated ground, along river banks and shores, in potreros and pedregal, on barren hilltops with flat outcrops of rock, on grassy campos, high and low campos, in barnyards and copses, in sandy soil and high fertile sandy prados, in dry riverbeds and floodplains, at the edge of woods, along dry roadsides, on uncultivated campos, on dry sandy banks and dry sunny banks, in waste ground, and along railroad tracks, mostly in full exposure to the sun, growing at altitudes of 20 to 3100 meters, flowering and fruiting in every month of the year. Troncoso (1937) reports it as cultivated in Buenos Aires, Argentina.

Eyerdam & Beetle found it in sandy alluvial soil near streambeds in the shade of shrubby yellow-flowered mimosas, while Ritter found it growing in a region of 1.5 m. rainfall and 10—35° temperature variation. Schwarz reports it as "rare" at Gob. Roca, Misiones, but Quiroga says that it is "abundant in high sandy waste soil" in Misiones. Rosengurtt found it "common along roadsides among shrubs", Jörgensen reports it "common on the campos at Villarica", common at Formosa, and common as El Candado in Catamarca. Morong says "this scarlet-flowered trailing *Verbena* seems to grow all over Paraguay and [blooms] nearly all the year round. I found it not only in copses about Asuncion, but also in the streets of the city, and far up on the Pilcomayo River. It is equally common a hundred miles east of Asuncion. The stems sometimes climb up among bushes for 6 dm. or more." Mexia describes it as "all along the roadside from Tucumán to Racas....one of the commonest flowering plants." Schulz reports it as "abundant" at Colonia Benítez in Chaco, and "in fertile soil of fields, abundant" at Tucumán; Hunziker found it "frequent" at Coronel Moldes in Salta; Herzog says that it is very common in the potrero at Charagua, Santa Cruz; and Meyer avows that it is "frequent in gardens and disturbed ground" at Resistencia. He says for his *no. 277* that it is "very rare", but since he describes the flowers of this collection as being pale-rose it may well be that it represents a hybrid. *G. J. Schwarz 615* is anomalous — its leaves are not as ovate as is usual for this species.

Hooker & Jackson (1895) state that *V. incisa* is native to Panama, but this is certainly an error. The species is known to me only from Brazil, Bolivia, Paraguay, Uruguay, and Argentina, although it is cultivated elsewhere and is probably one of the parents of the commonly cultivated *xV. hybrida* Voss. It is said to have been introduced into cultivation in or about 1826 -- it was certainly in cultivation in Belgium and France in 1838, in Italy in 1842, and in Spain in 1849. It is recorded as cultivated in Argentina by Parodi (1934) and Troncoso (1937).

Rümpler (1873) says: "Brasilien. — Einjährig, im Gewächshause ausdauernd. -- Diese Art, obschon sie ziemlich allgemein nur als eine Varietät der vorigen [*V. platensis*] betrachtet wird, unterscheidet sich doch von ihr in augenfälliger Weise ebenso wohl durch ihr fiederschnittigen, gelappten Blätter, wie durch ihre rosenrothen und geruchlosen Blumen. Aus Samen kommt diese Art mit allen ihren Merkmalen unverändert wieder und niemals bemerkt man unter den Sämlingen Pflanzen, welche mit *Verbena teucrioides* Aehnlichkeit hätten. Auch von dieser Art hat man durch Kreuzung mit der vorigen Art eine Anzahl von Varietäten erzielt, welche sich untereinander nur durch die gröszere oder geringere Intensität der rosenrothen Färbung unterscheiden. Kultur und Verwendung wie bei Nr. 7 [xV. hybrida]."

Augusto (1946) cites an unnumbered Tweedie collection from "Brasil meridional", as well as unnumbered collections by Augusto, Augusto & Edésio, and by Bornmueller from Rio Grande do Sul. The Reichenbach f. 180879, cited below, does not bear any indication on its label that it was from a cultivated plant, but I am assuming that it was.

The Curtis, Bot. Mag. 65: pl. 3628 reference is sometimes cited as "1837" or "1838", but this plate appears not to have been published actually until 1839. It should be noted, also, that Marnock, in his Floricult. Mag. 5: 87—88 (1840) cites his Verbena triumphans to "fig. 3" of plate 54. The numbers, however, seem to have become transposed on the plate — V. triumphans is illustrated as fig. 1, fig. 3 being V. rigida Spreng. and fig. 2 being Lythrum roseum Marnock.

The Florida record for V. incisa given by me in my Résumé Supplement 5: 2 (1962) was based on J. K. Small 8745, which I now regard as xV. hybrida Voss.

In all, 310 herbarium specimens, including type material of most of the names involved, have been examined by me.

Citations: BRAZIL: Paraná: Dusén 13564 (S, W—1481775); F. C. Hoehne s.n. [Curitiba, Oct. 18, 1928] (N, Sp—23061). Rio Grande do Sul: Collector undesignated 555 [Herb. Mus. Nac. Rio ref. V] (Ja); Henz 33438 (N); Leite 250 (N); Malme 640 (S), 1274 (S); Rambo 8990 (Sp—50983); Ritter 35460 (S); J. Vidal s.n. (Ja—46548). Santa Catarina: R. Fischer s.n. [Lencol, Feb. 8, 1920] (Sp—3679); F. Müller 96 (Ja—46534); Reitz 2233 (N), C.882 (Ja-55301, N). São Paulo: Bailey & Bailey 925 (Ba, Ba), 925a (Ba), 925b (Ba); A. Betzler s.n. [Herb. Jard. Bot. Rio Jan. 61346] (N); F. C. Hoehne s.n. [Campos do Jordão, Sept. 17, 1923] (N, Sp—8712). State undetermined: Sellow 3838 (Vt), s.n. [Brasilia] (Br, Vt). BOLIVIA: Santa Cruz: W. M. A. Brooke 5550 (Bm, N); T. Herzog 1217 (S). Tarija: R. E. Fries 1104 (N, S). PARAGUAY: C. Alvarez s.n. [Asuncion, 1954] (Je—8583, Je—8657), s.n. [Piribebuy, 1954] (Je—8729); Anisits 1978 (S), 2238 (S); Archer 4666 (N, N, W—1705489); Fiebrig & Osten s.n. [Herb. Osten 8062] (Ug); Hassler 567 (N), 2584 (N), 9252 (Bm), 12335 (N, W—1057289); Herter 84432 (N); Jörgensen 3772 [Herb. Osten 22242] (Du—197837, N, N, S, Ug, W—1483629); Lindman A.3901 (N, S, S); A. Lutz 1505 (Z); T. Meyer 15871 (N), 16162 (N); Morong 51 (C, Mi, W—71998, W—1417059); Osten 8046 (N, S, Ug), 9017 (S, Ug); Edw. Palmer s.n. [Capt. Page Exped. 1854] (W—227576), s.n. [Pilcomayo, Capt. Page La Plata Exped.] (W—227578); T. Rojas 1396 [Herb. Osten 7899] (Ug), 1894 [Herb. Hort. Parag. 10057; Herb. Osten 13572] (Ug), 3395 [Herb. Osten 17905] (Ug), s.n. [Herb. Osten 7535; Herb. Hicken 1192] (Ug), s.n. [Herb. Osten 15644] (N, Ug), s.n. [Herb. Osten 13572] (S); Sandeman 4861 (K); A. G. Schulz 7815

(Sz); Woolston 731 (W—2338284). URUGUAY: C. Alvarez s.n. [Trinidad, Junio 1954] (Je—8703); H. H. Bartlett 21096 (W—1907618); Herter 1057 [Herb. Herter 82941] (B, W—1422055), s.n. [Herb. Osten 19218] (Ug); Osorio s.n. (Ug—13943, Ug—13989); Osten 3196 (N, Ug, Ug); Rosengurtt B.2244 (N, Ug—5606). ARGENTINA: Buenos Aires: Cunningham s.n. [Buenos Ayres] (Bm); Sota 5 (N), 51 (N). Catamarca: Brücher & Brücher s.n. [21/1/49] (Ew); Jörgensen 1028 [Herb. Inst. Miguel Lillo 31350; Herb. Osten 11421] (Au, Ug); Rodriguez Vaquero 907 (Gg—353257, N); Schreiter 6437 [Herb. Inst. Miguel Lillo 32771] (N); Sleumer 2694 (Ca—49220, W—2168457); Venturi 7164 (Gg—161334). Chaco: R. M. Aguilar 844 (S); Boffa 1090 (N, N); Jörgensen 2466 [Herb. Inst. Miguel Lillo 31375; Herb. Osten 11866] (N, N, N, Ug, W—1055176); Malvárez 1365 (Gg—352673, N); T. Meyer 143 [Herb. Osten 22661] (Ug), 277 [Herb. Osten 22945] (Ug), 290 (Ug—10932), 2673 (N); T. Rojas 11785 (N); A. G. Schulz 277 [Herb. Osten 22945] (N), 1475 (N), 3988 (N); C. C. Schulz 783 (N, St); Venturi 33 (W—1043609). Córdoba: Caputanelli s.n. [Ruiz Leal 15990] (Ss); Lorentz 13 (Br), 436 (Sg—68311); O'Donell & Rodriguez 481 (N, Ut—72505b); Osten 10612 (Ug), 17086 (Ug); Rodrigo 246 (S); Ruiz Leal 12099 (Ss). Corrientes: Bonpland s.n. (N); Ibarrola 770 (W—1934120); Rodrigo 705 (N, N), 855 (N). Entre Ríos: T. Meyer 10154 (N); Ruiz Huidobro 3493 (N), 3565 (N), 3603 (N). Formosa: Eyerdam & Beetle 22937 (Ca—652376), 22954 (Ca—652379); Jörgensen 2469 [Herb. Osten 13667] (Ug); I. Morel 38 (N), 199 (N), 419 (N), 789 (Bm, S), 1008 (N, S), 1178 (N, Rf, S), 1493 (N), 2003 (N, Ok); Pierotti 4123 (Gg—353255, N). Jujuy: Eyerdam & Beetle 22355 (Ca—652259); Garolera & Romero 56 (N), 140 (N); Schreiter 515 [Herb. Inst. Miguel Lillo 31495] (N), 5151 [Herb. Osten 20013] (Ug); Venturi 5270 (Ca—342587, Gg—158412, N, W—1591468); J. West 6281 (Ca—561720). Misiones: Bertoni 1942 (N), 2251 (N), 2342 (N), s.n. [Herb. Inst. Miguel Lillo 28412] (N), s.n. [Santa Ana, 15-III-1944; Herb. Inst. Miguel Lillo 98412] (W—1931294); Ekman 1978 (N, S); Grüner 6 [Herb. Osten 23182] (Ug); J. H. Hunziker 773 (N); Jacinta s.n. [Herb. Osten 7079] (Ug); Lilliesköld s.n. [vic. of Colonia Bonpland] (S); Montes 1091 (N), 2435 (Gg—352671, N); Quiroga 164 [Herb. Osten 7683] (Ug); Rodrigues 576 (N); A. G. Schulz 6869 (Sz); G. J. Schwarz 615 (Bm, Ca), 1179 (S), 1243 (S), 2052 (Gg—353259, N), 2780 (S), 3000 (N), 3124 (N, S), 3162 (N). Salta: R. E. Fries 557 (S); Hunziker 1033 (W—1804066); Moldenke & Moldenke 19739 (N); Ruiz Leal 12627 (Ss); Steinbach 1611 [Herb. Inst. Miguel Lillo 31357] (N). San Luis: Pastore 2007 (N). Santa Fé: R. Alvarez 858 (S), 909 (Es, N); Balegno 499 (N); Job 1071 (N, S); Ruiz Leal 14321 (Ss); Terribile 366 (N, Ok), 448 (N, Ok), 476 (N), 492 (N); Venturi s.n. [Herb. Mus. Argent. Cienc. Nat. 23672] (N). Santiago del Estero: H. H. Bartlett 20421 (Mi); Maldonado R.472 (N); E. Wall s.n. [Escolta, 9/11/46] (Ew); Wall & Sparre s.n. [Guardia, 9/11/46] (Ew). Tucumán: Bailetti 58 (N); Bellomo s.n. [12/IX/1945] (N); Borsini 3 [Herb. Inst. Miguel Lillo 20403] (Bm, Ug--6397, Ut--115423b); Descole 1548 (N); Descole & Schreiter s.n. [Herb. Inst. Miguel Lillo 86115] (Bm, Ca--164751); Ferreyra 4059 (Ok); R. E. Fries s.n. [near Tucumán, 16-10-48] (S); Lillo 3220 [Herb. Inst. Miguel Lillo 31360] (N, N), 6181 [Herb. Osten 8458] (Ug); Lourteig 487 (N); Mexia 7832 (Ca--644015, N); T. Meyer 9799 (N); Moldenke & Moldenke 19721 (N), 19724 (N), 19754 (Es, Lg, N, Sm); Monetti 162 [Herb. Osten 10874] (Ug), 1623 [Herb. Inst. Miguel Lillo 31355] (N), s.n. [Herb. Inst. Miguel Lillo 31354] (N); Peirano s.n. [Herb. Inst. Miguel Lillo 32193] (N); Rocha 3693 (W--2198114), s.n. [San Augustin, s-X-1951] (Ba); Ruiz Leal 12401 (Ss), 12621 (Ss); Schreiter 8104 [Herb. Inst. Miguel Lillo 32810] (N), s.n. [Herb. Osten 12184] (N, Ug); A. G. Schulz 2887 (N); C. Skottsberg s.n. [Estacion Agricola Experimental, 16/10/1948] (Go, S); Sparre 404 (S), 737 (S), 1106 (S); Terribile 157 (N, Rf); L. A. Varela s.n. [Mariño, 9.III.1944] (Es, N); Venturi 378 [Herb. Osten 17242] (Ca--342611, Du--372485, N, N, S, Ug, W--1591218), 378b (Gg--151842, W--1343237), 2433 (N), 7360 (E--962368, W--1440924); E. Villa 453 (N), 680 (N); Wall & Sparre s.n. [Sabadilla, 19/11/46] (Ew), s.n. [Tafi Vieja, 19/11/46] (Ew), s.n. [Concepcion, 24/11/46] (Ew). Province undetermined: Friedmann s.n. [1923] (Ba). CULTIVATED: Austria: Reichenbach f. 180879 (V). Belgium: Herb. Martens s.n. [h. b. lov. 1838] (Br, Br); M. Martens s.n. [h. b. lov. 1839] (Br). Brazil: Bailey & Bailey 1234 (Ba); Sampaio 38 (Ja--46497), 7647 (Ja--46514), 7675 (Ja--46515, N), 7705 (Ja--46517, N). France: Herb. Harvey s.n. [h. R. P. 1838] (Du--166459), s.n. [h. R. P., julio 1844] (Du--166460). Germany: Herb. Martius s.n. [h. Monac.] (Br, Br); Herb. Mus. Bot. Lund. s.n. [Schwiebus, Aug. '72] (Lu); Herb. Prager 18643, in part (Gg). Italy: Herb. Harvey s.n. [hort. Bellovae 1842] (Du--166460). Spain: Herb. Hort. Matrit. 23 (Q). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 20 (Q), 21 (Q), 22 (Q), 24 (Q); Herb. Mus. Bot. Stockholm 2109x (S).

VERBENA INCISA f. ALBIFLORA Osten & Moldenke ex Moldenke, Phytologia 3: 176. 1949.

Synonymy: Verbena incisa lus. albiflora Osten ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940.

Bibliography: Moldenke, Prelim. Alph. List Invalid Names 46. 1940; Moldenke, Alph. List Invalid Names 48. 1942; Moldenke, Phytologia 3: 176. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127, 367, & 472. 1959.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Teodoro Meyer (*no. 518*, in part) at Fontana, Chaco, Argentina, in October, 1931, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo. The collector calls it "verbena de flores blancas" and says that it is "very rare". He describes it as a creeping perennial herb, 30--40 cm. long, the white flowers without fragrance, growing in campos and fertile prados. In my 1940 and 1942 works, cited above, I included this form in typical *V. incisa*, but now feel that it is worthy of nomenclatural recognition.

In all, 5 herbarium specimens, including the types of both names involved, and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Chaco: *T. Meyer 518* [Fontana, Oct. 1931; Herb. Osten 22699] (F--photo of type, N--photo of type, Sg--photo of type, Ug--type, Ug--isotype, Z--photo of type), *518* [Colonia Benítez, Dec. 1932; Herb. Osten 22946] (Ug); *A. G. Schulz 1478* (N, N).

xVERBENA INHONESTA Moldenke, Phytologia 5: 133. 1955.

Synonymy: *Verbena urticifolia* x *prostrata* Dermen, Cytologia 7: 170. 1936. *Verbena lasiostachys* Link x *V. urticifolia* L. ex Moldenke, Résumé 368, in syn. 1959. *Verbena urticifolia* L. x *V. lasiostachys* Link ex Moldenke, Résumé 377, in syn. 1959. *Verbena urticifolia* x *lasiostachys* Dermen ex Moldenke, Résumé Suppl. 2: 13, in syn. 1960.

Bibliography: Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 3: 468 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 353. 1958; Moldenke, Résumé 223, 368, 377, & 472. 1959; Moldenke, Résumé Suppl. 2: 13. 1960.

This is the hybrid between *Verbena urticifolia* L. and *V. lasiostachys* Link produced artificially by Dermen in Massachusetts and described by him in 1936. The two parental species do not normally grow together in the wild, one "parent" being native to the eastern United States and the other west of the Rocky Mountains. It is probable, therefore, that this hybrid will never be found in the wild state unless the parental species happen to become introduced at some future date in each other's territory. I doubt if it would have any horticultural merit.

VERBENA INTEGRIFOLIA Sessé & Moc., La Naturaleza, ser. 2, 1: app. [Pl. Nouv. Hisp., ed. 1] 6 [as "Uerbena"]. 1889 [not *Verbena integrifolia* Michx., 1845, in syn.].

Synonymy: *Verbena integrifolia* Sessé & Moq. ex Moldenke, Phytologia 2: 115, sphalm. 1945.

Bibliography: Walp., Repert. Bot. Syst. 4: 18. 1845; Sessé & Moc., La Naturaleza, ser. 2, 1: app. [Pl. Nouv. Hisp., ed. 1] 6.

1889; Sessé & Moc., Pl. Nouv. Hisp., ed. 2, 6. 1893; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Hill, Ind. Kew. Suppl. 7: 249. 1929; Perry, Ann. Mo. Bot. Gard. 20: 342 & 355. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18, 80, & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Phytologia 2: 87 & 115. 1945; Moldenke, Alph. List Cit. 1: 233. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 21. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 198. 1949; Moldenke, Résumé 39, 355, & 472. 1959; Lewis & Oliver, Am. Journ. Bot. 48: 639. 1961; Moldenke, Résumé Suppl. 3: 10 & 39. 1962.

Perennial bush; stems numerous, to 1.8 m. tall, sharply tetragonal, glabrous, shiny, deeply sulcate; nodes contracted, annulate; principal internodes 5--9.5 cm. long; leaves decussate-opposite, sessile, oblong or oblong-elliptic to elliptic, mostly narrow-elliptic, chartaceous, 2--5 cm. long, probably larger toward the base of the plant, 5--15 mm. wide, mostly acute, rarely rounded, at the apex, entire, narrowed to the rather broad sessile base, not clasping, glabrous above, with a very few appressed short hairs on the midrib beneath and along the margins; venation flat and inconspicuous above, the larger portions prominulous beneath; inflorescence axillary and terminal, spicate, numerous, usually somewhat paniculately disposed at the apex of the branches, rather long-pedunculate; peduncles slender, sharply tetragonal, glabrous or very slightly scattered-pilose, 5--10 cm. long, often with a pair of foliaceous bracts 5--16 mm. long at the apex subtending abbreviated secondary spikes; spikes filiform or slender, densely many-flowered, elongating to 8 cm. or more in age and then with the lower flowers widely separated; bractlets lanceolate, about 3 mm. long, usually equaling the calyx, white-ciliate along the margins at the base, acuminate or attenuate-acute at the apex; calyx 2.5--4 mm. long, antrorsely strigillose, short-apiculate at the apex; corolla small, pale-blue or purple, hypocrateriform, its tube slightly exserted from the calyx, glabrous on the outside, the limb about 3 mm. wide; chromosome number: n = 21.

The original very fragmentary description of this little-known species is "Uerbena tetrandra spicis filiformibus foliis oblongo-ellipticis integerrimis. Fl. Mex. Habitat in Queretari circuitibus. Floret Maio. ♃."

The species is known to me from only two collections, one of which was found in open rocky soil in the pine forest area on open rocky knolls in humid mountain valleys, from 2000 to 2330 meters altitude, flowering in August, and the other at 8300 feet altitude, flowering in June. Perry (1933) places it in her list of "Doubtful or Little-Known Species" and says of it "No known Mexican species of *Verbena* has entire leaves." However, the Gentry specimen cited below shows them very clearly and is said to have been taken from an "old" bush.

The *V. integrifolia* of Michaux is a synonym of *V. simplex* Lehm. and was published by Walpers (Repert. Bot. Syst. 4: 18. 1845) in synonymy only, so therefore does not invalidate the use of the same epithet by Sessé & Mocino. Hooker & Jackson (1895) erroneously give the page reference of the Michaux name as "13", instead of "18".

According to Gentry *V. integrifolia* is called "verbena" locally, as, of course, are many members of this and related genera. Only 2 herbarium specimens have been examined by me.

Citations: MEXICO: Michoacán: *R. L. Oliver 169* (Z). Sinaloa: *H. S. Gentry 6174* (N).

xVERBENA INTERCEDENS Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1057. 1904.

Synonymy: *Verbena bonariensis* x *ovata* Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1057, in syn. 1904. *Verbena bonariensis* L. x *V. ovata* Chám. ex Moldenke, Résumé 359, in syn. 1959. *Verbena ovata* Cham. x *V. bonariensis* L. ex Moldenke, Résumé 371, in syn. 1959. *Verbena tobaty* Davis ex Moldenke, Résumé Suppl. 3: 41, in syn. 1962.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1057. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 479. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Lilloa 6: 332 (1941) and 8: 432. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 101. 1942; Moldenke, Alph. List Cit. 1: 263 & 264. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 26. 1947; Moldenke, Alph. List Cit. 2: 599 & 600 (1948) and 3: 687. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99, 106, & 198. 1949; Moldenke, Phytologia 3: 75 & 76 (1949) and 3: 289. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 57. 1951; Moldenke, Phytologia 4: 188. 1953; Moldenke, Am. Midl. Nat. 59: 353—354. 1958; Moldenke, Résumé 110, 118, 119, 127, 359, 371, & 472. 1959; Moldenke, Résumé Suppl. 3: 29 & 41. 1962.

Coarse erect suffrutescent herb, 0.5—1.5 m. tall; stem pale yellow-green; leaves decussate-opposite, very stiff, pale yellow-green, paler beneath; bractlets pale yellow-green to purple-brown on the margins; calyx pale yellow-green; corolla blue or violet to rose or pale-mauve, paler in the throat, drying blue.

This is the natural hybrid between *V. bonariensis* L. and *V. ovata* Cham. Cotypes of the hybrid were collected by Emil Hassler (*no. 3324*) on a wet campo at Caraguatay and (*no. 6149*) in swamps near Tobaty, Paraguay. Briquet says: "Cette plante extrêmement intéressante possède à peu près l'inflorescence du *V. ovata*, à bractées raides, d'un violet foncé, mais les épis ne sort que partiellement subsessiles et réunis en ombelle, plusieurs d'entre aux sont ± longuement pédonculés, en corymbe plus lâche. En outre, les feuilles n'ont plus la forme largement ovée si caractéristique pour le *V. ovata*; elles sont oblongues, plus allongées et se rapprochent ainsi de celles du *V. bonariensis*. D'autre part, on distingue bien encore la *V. intercedens* du *V. bonariensis*, sous toutes ses formes, par la texture plus épaisse et plus raide des

feuilles, la face supérieure un peu luisante, la rugosité plus grande, les crénelures très aiguës, très robustes et plus rapprochées, les feuilles caulinaires souvent plus courtes (souvent 6 x 2 cm de surface); la partie supérieure de la tige est presque aphylle; les épis sont très hérissés-glanduleux. Ces caractères assignent au *V. intercedens* une place intermédiaire entre les *V. bonariensis* et *V. ovata*, entre lesquels il osville par tous ses caractères. Comme les *V. ovata* et *bonariensis* croissent ensemble dans les mêmes localités et les mêmes conditions d'habitat (marais à phases de déssiccation périodiques), nous croyons devoir interpréter cette plante comme le produit de croisement de ces deux espèces. On sait que dans l'Amérique du Nord, il existe de nombreux hybrides appartenant à cette section, et que, d'autre part, les espèces sud-américaines du groupe *Nobiles* ont produit dans les cultures de nombreux hybrides qui compliquent souvent beaucoup l'interprétation exacte des membres de ce groupe. Il n'y a donc rien de surprenant à constater des facts analogues entre les *V. bonariensis* et *ovata*."

Jörgensen reports that *V. intercedens* is "common" on the campo at Villarica. It inhabits low campos, wet places, and swamps in various stages of periodic drying-up, and has been collected in anthesis and fruit in September, November, December, and January. Herbarium material has been misidentified and distributed under the names *V. bonariensis* L., *V. bonariensis* var. *longibracteata* Kuntze, *V. rigida* Spreng., and *V. venosa* Gill. & Hook. On the other hand, the *Jörgensen 3768*, distributed as x*V. intercedens*, is actually *V. bonariensis* L. The Berro specimen cited below is very abnormal in appearance and may be virus-infected. Acevedo de Vargas (1951) states that Macbride's photograph 17422, cited below, was erroneously distributed as *V. landbecki* R. A. Phil. in her herbarium.

It is of interest to note that *V. ovata* — one of the reputed "parents" of this hybrid — has not yet been collected in Uruguay, although it has been found in the other localities where the hybrid has been encountered. One would suppose that both "parents" would be more plentiful than the hybrid everywhere where it occurs and would, therefore, be collected sooner and more often. Yet there seems to be no doubt whatever that *V. ovata* is one of the "parents" of this plant.

The *Jörgensen 3774* collection, cited below, is a mixture with *V. bonariensis* var. *conglomerata* Briq., probably as a result of two separate collections distributed under the same number -- a practice which this collector seems to have followed in numerous other cases.

In all, 19 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: *Rambo 43510* (Go, Go), *49696* (S). PARAGUAY: *Archer 4821* (W—1705560); *Hassler 6149* [Mac-

bride photo 17422] (Ca--944361--cotype, Kr--photo of cotype, N--cotype, N--cotype, N--photo of cotype, S--cotype), 8934 (V); Jörgensen 3770 [Herb. Osten 22245] (N, Ug), 3774, in part (Du--290264, N, S); Woolston 785 (B, W--2338285). URUGUAY: Berro 1626 (Ug); Rosa-Mato 728 (Ug--10047). ARGENTINA: Misiones: G. J. Schwarz 1896 (N). CULTIVATED: West Virginia: Davis & Davis 8061 (We).

VERBENA INTERMEDIA Gill. & Hook. in Hook., Bot. Misc. 1: 166. 1829 [not V. intermedia Penny, 1832].

Synonymy: Verbena gracilis Cham., Linnaea 7: 261--263. 1832 [not V. gracilis Desf., 1829]. Verbena tenuis Steud., Nom. Bot., ed. 2, 2: 751. 1841. Verbena chamissonis Walp., Repert. Bot. Syst. 4: 18. 1845. Verbena intermedia Gill. ex Lorentz, Veg. Nordeste Prov. Entre Rios 150. 1878. Verbena intermedia Gill. & Arn. ex R. A. Phil., Anal. Univ. Chil. 90: 616. 1896. Verbena intermedia Schau. ex R. A. Phil., Anal. Univ. Chil. 90: 616. 1896. Verbena bonariensis α brevibracteata Kuntze, Rev. Gen. Pl. 3 (2): 254--255. 1898. Verbena bonariensis β longibracteata Kuntze, Rev. Gen. Pl. 3 (2): 255. 1898. Verbena tandilensis Speg., Contrib. Estud. Fl. Tandil. 41. 1901. Verbena bonariensis var. brevibracteata Kuntze ex Briq., Arkiv Bot. Stockh. 2 (10): 10. 1904. Verbena carollata Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 101--102. 1907. Verbena corollata Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 102, sphalm. 1907. Verbena bonariensis var. longibracteata Kuntze ex Moldenke, Prelim. Alph. List Invalid Names 45, in syn. 1940. Verbena carrollata Briq. ex Moldenke, Lilloa 14: 53, sphalm. 1948. Verbena bonariensis f. brevibracteata Kuntze ex Moldenke, Résumé 359, in syn. 1959. Verbena bonariensis f. longibracteata Kuntze ex Moldenke, Résumé 359, in syn. 1959. Verbena bonariensis Schau. ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960 [not V. bonariensis Dill., 1938, nor L., 1753, nor Rendle, 1904, nor Vell., 1959]. Verbena rigida var. intermedia (Gill. & Hook.) Farwell ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962.

Bibliography: Gill. & Hook. in Hook., Bot. Misc. 1: 166. 1829; Desf., Cat. Hort. Paris, ed. 3, 393. 1829; Cham., Linnaea 7: 261-263. 1832; Hook. & Arn., Bot. Beech. Voy. 58. 1832; Steud., Nom. Bot., ed. 2, 2: 751. 1841; Hook. & Arn., Bot. Beech. Voy. 484. 1841; Walp., Repert. Bot. Syst. 4: 18--19 & 27. 1845; Schau. in A. DC., Prodr. 11: 541. 1847; Schau. in Mart., Fl. Bras. 9: 188. 1851; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 1, 19, 86, 150, & 172. 1878; Griseb., Abh. K. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 276. 1879; Lorentz & Niederlein, Exped. Rio Negro 2 (bot.): 264. 1881; Lillo, Fl. Tucuman 94. 1888; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 198. 1893; Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; R. A. Phil., Anal. Univ.

Chile 90: 616. 1896; Kuntze, Rev. Gen. Pl. 3 (2): 254--256. 1898; Speg., Contrib. Estud. Fl. Tandil. 41. 1901; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1057. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 479. 1904; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 291. 1904; Briq., Arkiv Bot. Stockh. 2 (10): 10. 1904; Macloskie in W. B. Scott, Rep. Princeton Univ. Exped. Patag. 8 (2): 686. 1905; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 101--102. 1907; Prain, Ind. Kew. Suppl. 3: 187. 1908; Hassler, Fl. Pilc. 102. 1909; Hicken, Chloris Plat. Argent. 196. 1910; Glaz., Mém. Soc. Bot. France 1: 544. 1911; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1913; Prain, Ind. Kew. Suppl. 4: 245. 1913; Sanzin, Anal. Soc. Cient. Argent. Buenos Aires 88: 98, 115, & 134. 1919; Molfino, Physis 5: 22. 1921; Seckt, Rev. Univ. Nac. Cordoba 17: 90. 1930; Herter, Florul. Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Monticelli, Lilloa 3: 359. 1938; Herter, Revist. Sudam. Bot. 6: 97. 1939; Troncoso, Darwiniana 3: 480--482 & 485, fig. 1 & 3 e & f. 1939; Moldenke, Prelim. Alph. List Invalid Names 45 & 56. 1940; Moldenke, Suppl. List Invalid Names 8--10. 1941; Ragonese, Darwiniana 5: 413. 1941; Moldenke, Lilloa 6: 332--333. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 41, 44, & 101. 1942; Moldenke, Alph. List Invalid Names 45--48 & 51. 1942; Moldenke, Lilloa 8: 429. 1942; Parodi, Darwiniana 6: 175. 1943; Rosengurtt, Estud. Prad. Nat. Urug. 3: 235 & 236 (1943) and 4: 8. 1944; Schnack & Covas, Darwiniana 6: 470 & 473. 1944; Moldenke, Lilloa 10: 346 & 347. 1944; Cabrera, DAGI Pub. Tec. 3: 45 & 75. 1945; Moldenke, Alph. List Cit. 1: 84--86, 197, 219, & 266. 1946; Rosengurtt, Estud. Prad. Nat. Urug. 5: 394. 1946; Schnack & Covas, Bol. Soc. Argent. Bot. 1: 284. 1946; Troncoso & Burkart, Darwiniana 7: 214 & 215. 1946; Augusto, Fl. Rio Grande do Sul 211 & 233. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22. 1947; Ragonese & Covas, Darwiniana 7: 443, 445, 455, & 487. 1947; Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 2, 19, 86, 150, & 172. 1947; Schnack & Covas, Haumania 1: 5 & 8, fig. 21. 1947; Moldenke, Castanea 13: 117. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 53. 1948; Moldenke, Lilloa 14: 53. 1948; Moldenke, Phytologia 2: 482. 1948; Moldenke, Alph. List Cit. 2: 458, 532, 533, 574, & 575 (1948), 3: 687, 693, 703, 704, 781, 782, 798, 859, 874, 875, 913, 922, & 923 (1949), and 4: 1128, 1196, & 1300. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Cabrera, Lilloa 20: 175. 1949; Rosengurtt, Lilloa 20: 132. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 100, 105, 106, 197, & 198. 1949; Moldenke, Phytologia 3: 76 & 135 (1949) and 3: 288, 289, & 305. 1950; Martínez Crovetto & Pichinini, Revist. Invest. Agric. 4: 178 & 226. 1950; Martínez Crovetto, Revist. Invest. Agric. 4: 362, 386, & 388. 1950; Rambo, Sellowia 7: 260. 1956; Moldenke, Résumé 110, 119, 126, 127, 359, 362, 365, 367, 376, 471, & 472. 1959; Moldenke, Résumé Suppl. 2: 5, 10, & 11 (1960), 3: 14, 37, & 40 (1962), and 4: 10. 1962.

Illustrations: Troncoso, Darwiniana 3: 481, fig. 1, & 485, fig. 3 e & f. 1939; Schnack & Covas, Haumania 1: 8, fig 21. 1947.

Tall, erect, biennial or perennial herb from a woody creeping rhizome, grayish-green throughout; stems mostly simple or sometimes branching, stout, strict, 0.5--1.5 m. tall, green, sharply tetragonal with rather prominent angles, very rough on the acute margins, sulcate and longitudinally striate between the angles, rather scabridulous above, otherwise smooth and glabrous, often rather densely hirtellous on the younger parts with sordid-grayish widely divergent hairs, glabrescent in age; branches slender, ascending, acutely tetragonal, longitudinally sulcate; nodes annulate;principal internodes 2--12 cm. long, those beneath the inflorescence longer than the rest; leaves decussate-opposite, sessile or subsessile, often subconnate; petioles (when present) very short; leaf-blades erect, stiffly coriaceous and rather rigid, uniformly dull- or light-green on both surfaces, not brunnescent in drying, 1--8 cm. long, 2--13 mm. wide, decreasing in size upwards, the lower ones cuneate-oblong or elliptic-oblong, rarely elliptic or elliptic-lanceolate, often shorter but broader than those immediately above, usually 3--8 cm. long and 5--10 mm. wide, those on the middle portions of the stem linear, oblong, lanceolate, or linear-lanceolate, all acute or acuminate-mucronate at the apex, strongly revolute along the margins, sharply incised-serrate or dentate toward the apex with a few rather sharp subequal teeth or entire, shortly prolonged into the petiole at the base, softly appressed-pubescent and scabridulous on both surfaces or lineate-rugose above and very rough with short callose hairs, hispidulous on the prominent venation beneath, rarely more or less pubescent throughout, the uppermost ones much reduced or even minute, sparse in the inflorescence, linear, 1--5 mm. long, 0.5--3 mm. wide, bractlet-like, stiff, entire, ciliolate; midrib slender, deeply impressed above, prominent beneath; secondaries slender, short, 4--6 per side, ascending, deeply impressed above, very prominent beneath; veinlet reticulation sparse, obscure or indiscernible on both surfaces; spikes terminal, distant or rather crowded, few (3--5), densely many-flowered, erect, the terminal one generally sessile and the lateral ones short-pedunculate, rather thick, 1.5--8 cm. long, normally 8--10 or more mm. wide, finally subcylindric, glandular-hirtellous throughout, the flowers and fruits closely imbricate; peduncles slender or rather slender, from subobsolete to 2.5 cm. long, sharply tetragonal, pilosulous or glandular-hirtellous; bracts 2 at each node of the inflorescence, lanceolate, rigid, about 3 mm. long, acuminate at the apex, glabrous; bractlets herbaceous, ovate-lanceolate or lanceolate, 3--4 mm. long, subequaling or equaling to longer than the calyx, rigid, acuminate or acute at the apex, densely glandular-hirtellous or pubescent on the back with rather short spreading hairs and ciliate-margined, with small stipitate glands mixed with the hairs toward the apex; calyx oblong or cylindric, 3--5 mm. long, often colored reddish or bluish, 5-costate, densely glandular-hirtellous on the outer surface, its tube 2.5--3.4 mm. long, the rim subulate-toothed, the teeth lanceolate, about 0.5 mm. long; corolla varying from blue, pale-blue, blue-violet, bright blue-violet, or rose-blue to lilac, clear lilac, violet, pale-violet, or purple, sometimes with the tube clear purple on the lower half and the rest white, 7—9 mm. long, mostly more than twice as long as the calyx, shortly glandular-puberulent or densely villosulous on the outside, the hairs comparatively long, stiff, and white, the limb well developed, about 3 mm. wide; stamens and pistil scarcely exserted from the corolla-mouth; cocci dark, oblong, about 2 mm. long; chromosome number: basic number = 7, 2n = 28 or 56.

The type of this often misunderstood species was collected by John Gillies on the pampas of Buenos Aires, Argentina ("in Provincia Bonariae, et in Pampas non raro occurrit"), and is deposited in the herbarium of the Royal Botanic Gardens at Kew. Cotypes of V. gracilis were collected by Friedrich Sellow at Barado and Curupa "in campo de Tacagua grande", Brazil, and are deposited in the herbarium of the Botanisches Museum at Berlin. Cotypes of V. tandilensis were collected by Carlo Luigi Spegazzini (nos. 2408 and 2409) in January, 1901, at Tandil, Argentina. The type of V. bonariensis var. longibracteata is R. Hauthal 649, collected at Ventana, Buenos Aires, in January, 1892, and deposited in the Britton Herbarium at the New York Botanical Garden. The type of V. carollata was gathered by Ernest Wilczek (no. 56) at Sierra Pintada, at an altitude of about 1400 meters, Mendoza, Argentina, in February, 1897, and is deposited in the Delessert Herbarium at Geneva. The pagination of the original description of this taxon is given erroneously as "100—101" in Lilloa 8: 429 (1942).

Kuntze describes his V. bonariensis var. longibracteata as "Bracteae comosae floribus parvis longiores. Folia lanceolata (1: 4—6)". His var. brevibracteata is based on undesignated collections from Tucumán, Argentina, from Contendas, Brazil, and from Montevideo, Uruguay, and is described by him as "Bracteae floribus parvis breviores vel subaequilongi." Seckt (1930) gives V. canescens H.B.K. as a synonym of V. intermedia, but this is erroneous. He apparently misinterpreted the statement of Schauer (1851) regarding V. gracilis Desf. (not Cham.) being in his opinion conspecific with V. canescens, a distinct species of Nevada, Texas, and Mexico. Verbena bonariensis γ longibracteata Walp. is conspecific with typical V. bonariensis L.

Verbena intermedia ranges from southern Brazil through Uruguay far into central Argentina. In Uruguay it has been collected at altitudes of 30 to 50 meters, and in Argentina at 50 to 2000 meters, the specimens from the higher Andean altitudes being in general more hairy. Quite characteristically galled inflorescences are seen on Legrand 1948 and 1985, Rosengurtt B.1915, and numerous other collections from Uruguay and Argentina. The galled portions of the spikes on these specimens are to 14 mm. wide and are very conspicuously white-hairy.

The species has been found by collectors in meadows and dry meadows, grassy places and savannas, rocky places, rocky or stony hills, low, wet, or dry campos, stony or dry rocky campos, dry sandy sunny campos, pampas, swamps, grassy slopes, hills and arroyos, dunes, riverbanks, the borders of "acequias", in the wet soil of meadows near rivers, in grassy rather wet campos, on mountains, in "lomas" [dry places], and on the shores of rivers. It is said to be frequent in fields, and has been found also on railroad embankments, at the edges of ditches, and among grass in very wet meadows. It is said to be frequent in wet soil, especially near rivers, and has been collected in anthesis from October to July, and in fruit in January, February, October, and November. Eyerdam, Beetle, & Grondona found it growing in black alluvium over stratified rock associated with pampas grasses and composites, and refer to it as an "annual". Hunziker found it "rather frequent" on the shores of Río Amzacate and also "rather frequent" on railroad embankments at Frenque Lanquen. Rosengurtt reports it as "common along railroad tracks" and, in his 1946 work, describes the plant as "Hierba frecuente en campos poco pacidos, vírgenes o de rastrojo". Ragonese & Covas (1947) refer to it as "Especie bienal o perenne, de tallos erectos, frecuente en rastrojos, campos cultivados, terrenos baldíos, etc." Cabrera (1949) says "campestre poco frecuente". Augusto (1946) cites a Sellow collection from "Campos do Brasil meridional", one of Rosebgurtt from Cerro Largo, Uruguay, and of Herter from Rivera, Uruguay. Ragonese (1941) cites *Covas & Ragonese 3505* from Santa Fé, Argentina, while Martínez Crovetto & Piccinini (1950) cite their *4718* from Entre Ríos. They cite the original publication of the species as "1830" and describe the plant as "Planta herbácea, perenne, con flores azuladas, común en casi toda la Mesopotamia; vive frecuentemente en suelos arenosos y a veces tiene tendencia a invadir suelos modificados. Florece de primavera a otoño."

Rosengurtt describes his plant as "Hierba hemicriptófita, florece a fines de primavera y verano. Habita prados vírgenes no pastoreados. Es rara."

Briquet's comments about his *V. carollata* are perhaps worth repeating here: "Nous avions rapporte cette espece en 1899 (in Ann. Cons. et Jard. bot. Geneve, IV, 18) au *V. littoralis* Kunth, concu á cette eopque dans un ses trés vaste. Une étude plus attentive de ce groupe, fait depuis lors, nous a amene a detacher du *V. littoralis* plusieurs types parfaitement distincte (*V. isabellei*, *V. cordobensis*). Le *V. corollata* s'ecarte a son tour du *V. littoralis* principalement par se corolle a tube siphone longuement exsert (depassant a peine les dents calicinales dans le *V. littoralis*), son calice oblong, plus grand, ses epis presque du double plus gros, etc."

Philippi (1896) was of the opinion that the plant described as *V. intermedia* by Schauer (1847) is not conspecific with that of Gillies & Hooker (1829), but there seems no doubt to me that they are the same. Rosengurtt (1943) describes the species as "Hierba hemicriptófita, florece en verano y principios de otoño. Habita praderas vírgenes de ladera, o uliginosas. Es escasa." Parodi (1943) says "habita en la estepa". Cabrera (1945) describes it as "Hierba perenne, erecta, de alrededor de 1,5 metros de altura, con tallo cuadrangular y hojas opuestas, sesiles, lanceoladas. Flores pequeñas, violáceas, dispuestas en espigas largas que se agrupan en panojas definidas. Frecuente en la estepa pampeana." Osten found it growing with *V. bonariensis* L. and suggested that it might be only a form of the latter or a hybrid with it, commenting "spicis elongatis cylindricis laxifloris". Schnack & Covas (1943) report that its chromosome picture is 2n = 28, but in their 1946 and 1947 works report for "*V.* aff. *intermedia*" a picture of 2n = 56, based on a plant cultivated at Capital, Mendoza, originally from Sierras de Balcarce, Buenos Aires.

Briquet in Ann. Conserv. & Jard. Bot. Genèv. 7-8: 291 (1904) maintains that Kuntze's *V. bonariensis* var. *brevibracteata* is essentially characterized by its short bractlets which hardly equal the flowers in length or very slightly surpass them, the corollas being small, exceeding the calyx-teeth by only 1—1.5 mm., the limb being 1—1.5 mm. in diameter, and that therefore it is exactly synonymous with typical *V. bonariensis*. Kuntze's type, however, on which we must base the name regardless of the description given of it, and which I have examined, proves to be *V. intermedia*. Monticelli (1938) says of *V. intermedia*: "Es afín a la *V. bonariensis*, de la que se aparta por la corola larga dos veces la longitud del cáliz." Troncoso (1939) differentiates the two species as follows:

"A. Tallos estriados longitudinalmente, glabros, con las aristas de los angulos mas o menos asperas. Limbo corolar bien desarrollado. Caliz y bracteas con pelos glandulares. Inflorescencias parciales distanciadas, c/u de 3—5 espigas, generalmente la terminal subsesil, las laterales pedunculadas. Hojas inferiores de 5—8 cm. de largo x 0,8—1 cm. de lat., borde dentado en su mitad superior, dientes subiguales. Plantas verde-cenicientas.......... *V. intermedia*.

"B. Tallos lisos, hirsutos principalmente en las aristas de los angulos. Limbo corolar reducido. Caliz y bracteas sin pelos glandulares. Inflorescencias parciales aglomeradas, c/u de 4—10 espigas subsesiles. Hojas inferiores de 9—13 cm. de long., x 1—1,5 cm. de lat., borde casi totalmente dentato, dientes desiguales. Plantas de color verde intenso.............*V. bonariensis*."

Troncoso & Burkart (1946) say "*V. intermedia*....se distingue, aparte de los rasgos ya comentados, por flores más grandes y vistosas [than *V. tristachya*], de color violáceo intenso, limbo corolar bien desarrollado, cáliz y brácteas con pelos glandulosos, estilo breve y estambres fijos en la mitad inferior del tubo corolar.......*V. intermedia* y *V. montevidensis* tienen los tallos macizos......El estudio anatómico del tallo de *V. tristachya* presenta como característica interesante, que la capa de parénquima clorofiliano es continua, es decir, que no se halla interrumpida en los ángulos por la columna esclerenquimática. Esta última estructura caracteriza a....*V. intermedia*." They describe the number of spikes as "infinitas".

Walpers (1845) places his *V. chamissonis* in Section *Verbenaca*, Subsection *Inermes*, Group *Foliosae*, Subgroup *Micranthae*, and Secondary Subgroup *Holophyllae*, while *V. intermedia* is placed in Subgroup *Macranthae*, Secondary Subgroup *Melindres*. Schauer (1847) correctly combines them in his Section *Verbenaca*, Subsection *Pachystachyae*. The *V. intermedia* of Penny referred to above is a synonym of *V. canadensis* (L.) Britton.

A reference to *V. intermedia* in "Briq., Verb. Balans. Parag. 4" has not been verified by me as yet. In Lilloa 10: 347 (1944) it is stated that *Gallinal*, *Aragone*, *Bergalli*, *Campal*, & *Rosengurtt PE.4605* is a mixture with *V. carollata* Briq., but I do not now believe this and regard it now as all *V. intermedia*. The common names "berbena" and "verbena" are recorded for *V. intermedia*, but are used also for many other species in this and related genera. The Steudel reference given above is sometimes cited as "1840", but appears to be more correctly dated 1841. *Jörgensen 2468* is definitely *V. bonariensis* in the Montevideo herbarium and is definitely *V. intermedia* in the United States National Herbarium — another example of this collector's habit of mixing several collections under the same number!

Hunziker describes the corolla on his *no. 4003* as being clear "morada" on its lower half and the rest white. Hooker & Arnott record the species from Chile, apparently in error.

Herbarium material has been misidentified and distributed under the names *V. bonariensis* L., *V. brasiliensis* Vell., and *V. carollata* Briq. On the other hand, *Jörgensen 3774*, distributed as *V. intermedia*, is actually *V. bonariensis* var. *conglomerata* Briq.; *Kuntze s.n.* [Montevideo, 7/12/1891] is *V. brasiliensis* Vell.; *Herter 1058* and *Herb. Herter 82656* are *V. gracilescens* (Cham.) Herter; and *Legrand 1992* & *3809* are *V. montevidensis* Spreng.

Glaziou (1911) cites his *no. 14162a* from Rio de Janeiro, Brazil [his *no. 14162* he identifies as *V. litoralis* H.B.K., but I regard it as *V. brasiliensis* Vell. — I have not seen his *no. 14162a*], while Briquet (1904) cites *Hassler 1026a* and *Regnell A.3645*. Troncoso (1939) cites the following: URUGUAY: *Rosengurtt B.765* (Si), *B.2513* (Si). ARGENTINA: Buenos Aires: *Carette 497* (Si); *Hicken 475* (Si), *s.n.* [22-I-1900] (Si--3825); *Pastore s.n.* [21-XI-1937] (Si—1140); *Pelosi 18* (Si); *Spegazzini 2408* (Si), *2409* (Si), *s.n.* [I.1901] (Si); *Troncoso s.n.* [24-XI-1937] (Si--1246); *Valentini 502* (Si). Chaco: *Lynch s.n.* [19-I-1904] (Si—3828). Córdoba: *Burkart 7493* (Si); *Nicora 1574* (Si). Corrientes: *Burkart 8053* (Si); *Hicken s.n.* [Bonpland, XI-1929] (Si—3829). La Pampa: *Monticelli C.17* (Si). Mendoza: *Ruiz Leal 1046* (Si).

In all, 122 herbarium specimens and 10 mounted photographs, including type or phototype material of most of the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Malme 136 (S), 136b (N, S), 808 (N, S); Rambo 9718 (Sp--50987), 34723 (N); A. R. Schultz 746 (N); Schwacke II.336 (Ja--46576); Sellow s.n. [Bras. merid.; Macbride photos 17423] (Br, Br, F--photo, Kr--photo, N--photo, N-photo, Si--photo, Z--photo); J. Vidal s.n. (Ja--36857). URUGUAY: Aplin s.n. [Sta. Elena, Nov. 1892] (Bm); Arechavaleta 31 (Ug), 32 (Ug), 38 (Ug), 41 (Ug), 102 (Ug, Ug), 3135, in part (Ug); Berro 37 (Ug), 4423 (N), 8472 (N); Cabrera 3890 (N); Castellanos s.n. [Herb. Inst. Miguel Lillo 11756] (N, N); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt PE.2621 (N), PE.2882 (N), PE.4605 (N, N); Herb. Herter 80042 (N); Herter 1155 [Herb. Herter 83295] (Ca-407266, N, N), s.n. [Herb. Osten 17032] (Ug), s.n. [Herb. Osten 18499a] (Ug); Legrand 1948 (Ug), 1985 (N, Ug), 2309 (Ug), 2571 (Ug), 4127 (Ug); Montoro Guarch 574 (N); Osorio 730 (Ug--13265); Osten 3661 (Ug), 3863 (Ug), 3947 (Ug), 4349 (Ug, Ug), 6567 (Ug), 7797 (Ug), 21669 (Ug, Ug), 21868 (Ug), 22650 (Ug), 22650a (Ug); Rosengurtt 6018 (W--2028814), B.765 (Ca--79809, N, N), B.1915 (N, Qu), B.3246 (N), B.3255 (N). ARGENTINA: Buenos Aires: Cabrera 4288 (N), 5164 (N), 5749 (N); Eyerdam, Beetle, & Grondona 23642 (Ca--623654); Gillies s.n. [Pampas of Buenos Ayres] (N--photo of type, Z--photo of type); Hauman s.n. [Sierra Baya, V. 1923] (Br); Hauthal 649 (N); Hunziker 4003 (N); A. G. Schulz 5697 (Sz); Troncoso 1246 (W--1858347); Wall & Sparre s.n. [Sierra Bachiche, 2/11/46] (Ew), s.n. [Sierra El Volcan, 3/11/46] (Ew). Chaco: Jörgensen 2468, in part (W--1055178); A. G. Schulz 1481 (N). Córdoba: Burkart 7493 [Herb. Osten 23368] (N, Ug); A. T. Hunziker 701 (N); O'Donell & Rodriguez 454 (Ut--115405b); Osten 13111 (Ug); Pierotti 5004 (N); Rodrigo 309 (N); Sparre 1422 (S), 1425 (S); E. Wall 5, in part [16/12/46] (Ew); Wall & Sparre s.n. [El Quebrado, 16/12/1946; 900 m.] (N), s.n. [El Quebrado, 16/12/1946; 1300 m.] (Ew). Corrientes: Burkart 8053 (Ca--3374, W--1858299); Parodi 12444 (N). Entre Ríos: Ruiz Huidobro 3492 (N), 3550 (N), 3649 (N). Formosa: Jörgensen 3408 (W--1065729). La Pampa: Fortuna 22 (Ca); A. G. Schulz 5842 (Ca--166282). Mendoza: D. O. King 137c (Bm); Lourteig 852 (Ca--166002); Ruiz Leal 1101 (N), 1171 (N), 1498 (N), 2980 (N), 5595 (N), 7084 (N), 8500 (N), 11388 (Rl); Ruiz Leal & Roig s.n. [Ruiz Leal 18809] (Z); Sanzin 3120 [Herb. Osten 15634] (Ug); Semper 343 (S); Wilczek 56 [Macbride photos 24683] (Kr--photo, N--photo). Misiones: Burkart 15449 (N, W--2056387); Ruiz Huidobro 4995 (N); A. G. Schulz 6903 (Sz); Schwacke 2249 [Herb. Mus. Nac. Rio ref. I] (Ja). San Luis: F. A. Roig 1327 [Herb. Ruiz Leal 19077] (Ok); Varela 566 (S); Vignati 7029 (W--1858375). Santa Fé: Feddersen s.n. [Aurelia, near S. Fé] (Cp); Ruiz Huidobro 3138 (N). Province undetermined: Wall & Sparre s.n. (Ew).

VERBENA INTERMEDIA f. ALBIFLORA Moldenke, Phytologia 3: 176. 1949.

Bibliography: Moldenke, Phytologia 3: 176. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127 & 472. 1959.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Arturo Burkart (no. 4179) in xerophilous woods on the steppe at Gualeguaychú, Entre Ríos, Argentina, on January 5, 1932, and is deposited in the Osten Herbarium at the Museo de Historia Natural at Montevideo. The form is known thus far only from the type collection, of which 1 herbarium specimen and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Entre Ríos: Burkart 4179 [Herb. Osten 22466] (F--photo of type, N--photo of type, Sg--photo of type, Ug--type, Z--photo of type).

VERBENA INTERMEDIA f. GLABRESCENS Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1914.

Bibliography: Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1914; Moldenke, Known Geogr. Diatrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127 & 472. 1959.

This form differs from the typical form of the species in being subglabrous and in having non-auriculate leaves which are hardly subamplexicaul at the base, the flower spikes 15--18 mm. long and 4 mm. wide, the lanceolate bractlets, and the corolla often more than twice (but never 3 times) as long as the calyx.

The type of the form was collected by Lucien Hauman-Merck (no. 344, in part) near the shores of the Río Negro and its islands, in protected spots, Río Negro, Argentina, where the author says that the species itself is very common [but from where I have seen no specimens of it as yet!]. He notes that the form is like certain forms of V. litoralis H.B.K. except for the greater length of the corolla. No material has as yet been seen by me.

VERBENA INTERMEDIA var. LANUGINOSA Moldenke, Phytologia 3: 118. 1949.

Bibliography: Moldenke, Phytologia 3: 118 & 135. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127 & 472. 1959.

This variety differs from the typical form of the species in having its stems, branches, peduncles, and leaves (especially the lower surface) very densely lanuginous. The corolla is said to be blue.

The type of the variety was collected by Adrian Ruiz Leal (no. 2981) at the edge of a dry river at La Pampa, San Pablo, dept. Tunuyan, Mendoza, Argentina, on February 6, 1935, and is deposited in the Britton Herbarium at the New York Botanical Garden. The variety is known thus far only from the original collection, of which 1 herbarium specimen and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Mendoza: Ruiz Leal 2981 (F--photo of type, N--type, N--photo of type, Sg--photo of type, Z--photo of type).

VERBENA JORDANENSIS Moldenke, Phytologia 2: 237. 1947.

Synonymy: Verbena pusilla Dusén ex Moldenke, Résumé 373, in syn. 1959.

Bibliography: Moldenke, Phytologia 2: 237. 1947; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 2: 598 (1948) and 4: 1249 & 1287. 1949; Moldenke, Known Geogr. Distrib Verbenac., [ed. 2], 94 & 198. 1949; Moldenke, Phytologia 3: 134 (1949) and 3: 454. 1951; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Angely, Fl. Paran. 7: 13. 1957; Moldenke, Résumé 110, 373, & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961.

Perennial herb, about 16 cm. tall, abundantly branched from the base, bushy; branches decussate-opposite, obtusely tetragonal, rather densely spreading-pubescent, brown when dry; principal internodes 1--2 cm. long; leaves decussate-opposite, subsessile; petioles 1 mm. long or less, winged; leaf-blades ovate, tripartite, 7--25 mm. long, 5--15 mm. wide, each of the 3 divisions again lobed or incised, the lobes narrow and obtuse, more or less asperulous-strigillose above, spreading pilosulous on the venation and margins beneath, the margins subrevolute; midrib and secondaries subimpressed above, prominulous beneath; inflorescence axillary, racemose, the racemes few-flowered, 1--2 cm. long in fruit, usually less than 1 cm. long during anthesis; peduncles filiform, obsolete during anthesis, to 1 cm. long in fruit and spreading-pubescent like the branches; bractlets ovate, about 3 mm. long, 1 mm. wide at the base, thinner toward the margins especially toward the base, attenuate to the sharply acute apex, rather irregularly long-ciliate along the margins, especially toward the base, reflexed in age; calyx tubular, about 4 mm. long, 5-costate, very shortly 5-apiculate on the rim, the costae spreading-pubescent, otherwise glabrate, the apiculations coherent after anthesis; corolla hypocrateriform, rose or white, its tube narrow-cylindric, about 4 mm. long, the limb about 2 mm. wide, glabrous, irregularly 5-lobed; ovary subtended by a cupuliform disk about 1 mm. in diameter, which remains in the axil of the bractlet after the fruiting-calyx and fruit have been shed; fruiting-calyx not enlarged, readily splitting when the fruit matures, the apiculations remaining coherent almost up to the time of shedding of the fruit; nutlets narrowly oblong, about 2 mm. long, reticulate-scrobiculate on the back on the upper half, with parallel longitudinal ridges on the lower half, glabrous, shiny.

The type of this most interesting and distinctive species was collected by José Eugenio Leite (no. 3474) in wet places and fields, Campos do Jordão, at an elevation of 1600 meters, São

Paulo, Brazil, in April, 1945, and is deposited in his herbarium at Novo Friburgo, Rio de Janeiro, Brazil. The conspicuous disks beneath the ovary, which remain in the axils of the reflexed bractlets after the fruiting-calyx and fruit have been shed, render this species most remarkable and show its relationship to V. thymoides Cham.

The species has been collected in wet and grassy places, fields, and low woods, on campos, and on rocky slopes, at altitudes of 750 to 1821 meters, blooming in January, April, and September to November. Rambo found it "in campo alte graminoso subhumido", while Leite says "very rare, near wet places". The type of V. pusilla was collected by Gösta Jönsson (no. 1010a) in grassy places at Itaperussu, Paraná, Brazil, on September 27, 1914, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm.

In all, 28 herbarium specimens, including the types of both names involved, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Dusén 7138 (N, S); Jönsson 1010a (S). Rio Grande do Sul: Rambo 36410 (F--photo, N, N, N--photo, S, Sg--photo, Z--photo). Santa Catarina: F. Müller 93 (Ja--46531, N); Reitz & Klein 4868 (N, Ok, W--2268943), 5193 (Ok, S, W--2268975), 5422 (Ok, W--2269003); Smith & Reitz 10360 (W--2249371), 10382 (Ok, W--2251674), 10385 (W--2249372), 10478 (W--2249373), 10489 (W--2249374); Smith, Reitz, & Klein 7663 (W--2251305, Z). São Paulo: Leite 3474 (El--type, N--isotype), s.n. [Campos do Jordão, I-1949] (N, W--1953453).

xVERBENA KONDAI Moldenke, Phytologia 2: 148. 1946.

Synonymy: Verbena racemosa x erinoides Dermen, Cytologia 7: 163, fig. 8, & 170. 1936. Verbena racemosa x erinoides alba Dermen, Cytologia 7: 170. 1936. Verbena racemosa x laciniata Dermen ex Moldenke, Am. Midl. Nat. 59: 354, in syn. 1958. Verbena racemosa Eggert x V. tenuisecta Briq. ex Moldenke, Résumé 373, in syn. 1959. Verbena tenuisecta Briq. x V. racemosa Eggert ex Moldenke, Résumé 376, in syn. 1959.

Bibliography: Dermen, Cytologia 7: 163, fig. 8, & 170. 1936; Moldenke, Phytologia 2: 148. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 26. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 164 & 198. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2211. 1951; Moldenke, Am. Midl. Nat. 59: 354. 1958; Moldenke, Résumé 223, 373, 376, & 472. 1959; Moldenke, Résumé Suppl. 3: 40. 1962.

Illustrations: Dermen, Cytologia 7: 163, fig. 8. 1936.

This plant is a hybrid between V. racemosa Eggert and V. tenuisecta Briq., produced artificially by Dermen in Massachusetts in 1936, and said to have intermediate characters. The two parental species both grow wild in Texas, the former native and the latter introduced. As yet I have no record of them from the same county, but V. tenuisecta is spreading very rapidly and it is probably only a matter of time before both will be growing in close proximity to each other. The hybrid may then be expected in the wild. It ought to have considerable horticultural merit.

VERBENA KUNTZEANA Moldenke, Phytologia 2: 474--475. 1948.

Synonymy: Verbena megapotamica hybrida Osten ex Moldenke, Résumé 369, in syn. 1959.

Bibliography: Moldenke, Phytologia 2: 474--475 (1948) and 3: 75, 134, & 136. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99, 106, & 198. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 110, 118, 127, 369, & 472. 1959; Moldenke, Résumé Suppl. 3: 14 (1962) and 7: 5. 1963.

Suffrutescent herb or subshrub, 3--6 dm. tall, several-branched from the base; stems and branches rather slender, obtusely tetragonal, the sides often sulcate, densely hirsutulous-pubescent with widely divergent, grayish-sordid, and mostly gland-tipped hairs, the lower part of the stems often decumbent; nodes annulate; principal internodes 2--5 cm. long; leaves decussate-opposite; petioles rather obscure, broadly winged and merging into the leaf-base; leaf-blades chartaceous, bright-green above, paler beneath, ovate, 2.5--5 cm. long, 1.4--2 cm. wide, acute at the apex, acuminate into the winged petiole at the base, rather coarsely but regularly serrate from the widest part to the apex, the teeth rather broadly triangular, obtuse or subacute, densely hirsutulous-pubescent on both surfaces, the hairs often slightly bulbous-based above; midrib slender, impressed above, prominulous beneath; secondaries slender, 3--5 per side, ascending, impressed above, prominulous beneath; veinlet reticulation plane or subimpressed above, the larger parts subprominulous beneath; inflorescence terminal, subcapitate; peduncles slender, 6--8 cm. long, tetragonal, sulcate, densely glandular-hirsutulous; floriferous portion of the inflorescence about 3.5 cm. long, to 2.5 cm. wide during anthesis; bractlets elongated, linear-lanceolate, 11--13 mm. long, densely glandular-hirsutulous with whitish hairs, often somewhat incurved after the flowers have fallen; rachis densely glandular-hirsutulous; calyx tubular, the tube about 15 mm. long and 2 mm. wide, densely glandular-hirsutulous with whitish hairs, the rim 5-apiculate, the apiculations linear-caudate, unequal, densely glandular-hirsutulous with whitish hairs, the longest ones about 4 mm. long; corolla blue or violet-blue to rose-lilac, its tube 15--20 mm. long, densely short-pubescent on the outside, the limb about 10 mm. wide, minutely puberulent on the outer surface, glabrous within.

The type of this distinct species was collected by Carl Axel Magnus Lindman (no. A.3649) at Paraguarí, Paraguay, in October, 1893, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The collector notes that the native name for the plant is "flor de vovia". It was first identified by Briquet as V. paraguariensis var. latiuscula Briq. and then as V. platensis Spreng. It is named in honor of Carl Ernst Otto Kuntze, who did such splendid collecting of Verbenaceae and related groups in Asia, Africa, and America, whose keen insight has detected so many varieties and forms worthy of nomenclatural recognition, and who fought so heroically and eloquently for fair play and honesty in botanical nomenclature, albeit a losing battle.

The species has been collected in fields, campos, wet campos, and on high rocky ground, at 1200 meters altitude, blooming in September, October, and December to March, in fruit in September. Herbarium material has been misidentified and distributed under the names V. megapotamica Spreng., V. phlogiflora Cham., V. platensis Spreng., V. platensis var. latiuscula Briq., and V. platensis var. stenodes Briq. Rojas 3406 was identified by Osten as "Verbena megapotamica Spr. hybrida". The Pedersen 4069, distributed as "Verbena aff. kuntzeana Mold.", is actually V. nana Moldenke.

In all, 27 herbarium specimens, including the types of both names involved, and 6 mounted photographs have been examined by me.

Citations: BRAZIL: Minas Gerais: Widgren s.n. [1845] (Lu). Paraná: Braga 1030 (Z); Braga & Lange 255 (Gg). Santa Catarina: Moreira & Moreira 234 (Gg); Smith & Reitz 10161 (W--2249365). PARAGUAY: Fiebrig 5699 (W--1134886); Hassler 3936 (N), 4428 (N), 5758 (Ca--935082, N), 6357 (N), 6624 (N), 11052 (Bm, Cb, Cb, Cb, N, N--photo, Z--photo); Lindman A.3649 (F--photo of type, N--isotype, N--photo of type, S--type, S--isotype, Si--photo of type, Z--photo of type); T. Rojas 3406 [Herb. Osten 17906] (N, N, Ug), s.n. [Herb. Osten 15638] (N, N, Ug). ARGENTINA: Salta: Schreiter 11467 (N).

VERBENA LACINIATA (L.) Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 296--297. 1904 [not V. laciniata Kuntze, 1941, nor Raf., 1833, nor Sessé & Moc., 1940].

Synonymy: Lychnidaea, Verbenae tenuifoliae folio, vulgò Sandia-Laguen Feuill., Journ. Obs. Phys. Côtes Orient. [3]: 35--36. 1725. Lychnidaea Verbenae tenuifoliae, vulgo Sandia Laguen Feuill., Journ. Obs. Phys. Côtes Orient. [3]: pl. 25, [fig. 2]. 1725. Erinus laciniatus L., Sp. Pl., ed. 1, 2: 630. 1753. Lychnidea verbena tenuifoliae folio Feuill. apud L., Sp. Pl., ed. 1, 2: 630, in syn. 1753. Verbena erinoides Lam., Tabl. Encycl. Méth. Bot. [Illustr.] 1: 57. 1791 [not V. erinoides Auth., 1959, nor Chod., 1904, nor Hook., 1934, nor Hook. & Arn., 1959, nor H.B.K., 1963, nor Poepp., 1847, nor Spreng., 1830, nor Willd., 1947]. Verbena multifida Ruíz & Pav., Fl. Peruv. & Chil. 1: 21, pl. 33c. 1798. Erinus (laciniatus), foliis laciniatis L. apud

Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Lychnidea verbenae tenuifoliae folio, vulgò sandia-laguen Feuill. apud Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Verbena (multifida), tetrandra, floribus capitato-umbellatis; foliis semitrifidis, laciniis bi trifidis Ruíz & Pav. apud Poir. in Lam., Encycl. Méth. Bot. 8: 547, in syn. 1808. Verbena spicis solitariis, corollarum laciniis emarginatis; foliis laciniatis, subsessilibus Lam. apud Poir., Encycl. Méth. Bot. 8: 547, in syn. 1808. Verbena selloi Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825. Verbena odorata Meyen, Reise 1: 480--481. 1834 [not V. odorata Desf., 1821, nor L'Hér., 1941]. Lychnidea verbenae tenuifoliae folio, vulgó Sandia Laguen Feuill. apud Lindl. in Edwards, Bot. Reg., 21: pl. 1766, in syn. 1835. Verbena erinoides L. ex Walp., Nova Act. Acad. Nat. Caes. Leopold.-Carol. Cur. 19: Suppl. 1: 379. 1843 [not V. erinoides L. ex Lorentz & Niederlein, 1881]. Shuttleworthia selloi (Spreng.) Walp., Repert. Bot. Syst. 4: 13. 1845. Lychnidea Verbenae tenuifoliae folia Feuill. apud Walp., Repert. Bot. Syst. 4: 31, in syn. 1845. Shuttlworthia selloi Walp. apud Schau. in A. DC., Prodr. 11: 553, in syn. 1847. Lychnidea etc. Feuill. apud Schau. in A. DC., Prodr. 11: 553, in syn. 1847. Verbena erinoïdes Lam. apud C. Gay, Hist. Fis. Chile Bot. 5: 10. 1849. Verbena erinoïdes β prostrata C. Gay, Hist. Fis. Chile Bot. 5: 10. 1849. Lychnidea verbenae tenuifoliae folio, vulgo Sanda-Laguen Feuill. apud Schau. in Mart., Fl. Bras. 9: 194--195, in syn. 1851. Verbena pulcherrima Vilm., Fleurs Pl. Terre, ed. 1, 937. 1865. Verbena multifida Hort. ex Regel, Gartenfl. 28: 372--373, in syn. 1879. Verbena erinoides var. multifida Ruíz & Pav. ex C. Ludwig, Wien. Ill. Gart.-Zeit. 20: 443. 1895. Shuttleworthia selloi Walp. ex Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 895, in syn. 1895. Verbena pulcherrima Haage & Schmidt, Cat. Général 1898: 93. 1898. Verbena geraniifolia Haage & Schmidt, Cat. Général 1898: 93, in syn. 1898. Verbena crinoides Lam. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1059, sphalm. 1904. Schulltdeworthia selloi Walp. ex Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 296, in syn. 1904. Lychnidaea Feuill. ex Reiche, Fl. Chile 5: 294, in syn. 1907. Verbena laciniata Briq. ex Prain, Ind. Kew. Suppl. 3: 187. 1908. Glandularia laciniata (L.) Schnack & Covas, Darwiniana 6: 475. 1944. Verbena odorata Meyer ex Augusto, Fl. Rio Grande do Sul 233, sphalm. 1946. Verbena glandularia Jürgensen ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Verbena multifida Pavon ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947. Lychnidea veronicae tenuifoliae folia, vulgo Sandia-Laguen Feuill. ex Moldenke, Résumé 318, in syn. 1959. Verbena erinoides var. laciniata (L.) Briq. ex Moldenke, Résumé 364, in syn. 1959. Lychnidea, Ver-

benae tenuifoliae folio, vulgò Sandia-Laguen Feuill. ex Moldenke, Résumé Suppl. 2: 9, in syn. 1960.

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Low annual or perennial, very polymorphic herb, decumbent or prostrate, suffrutescent at the base, forming mats to 1 m. in diameter; stems prostrate or creeping, wiry, radiating from a taproot and central root-crown, usually to about 30 cm. long, rooting at the nodes, much branched, strigose-hirtous or subhirsute, more or less cinerescent; branches short and erect or ascending or else elongate-decumbent and rooting, very sparsely puberulent-pilosulous; leaves decussate-opposite, crowded or remote, inclined to be pale-green or grayish, very viscid when fresh [according to Sandeman], the blades 1.5—2.3 cm. long, pinnatifid-laciniate to deeply pinnatisect or the upper ones 3-parted, strigose or strigillose on both surfaces, more densely so on the venation beneath, cuneate at the base and decurrent into the petiole, the segments ovate-oblong or oblong-lanceolate to lanceolate or linear, acute or subacute to obtuse at the apex, entire to subdentate or dentate along the margins and there slightly revolute; spikes lateral and terminal, small, usually fascicle-like or in close flattened heads to 5 cm. wide, somewhat elongating after anthesis, pedunculate, many-flowered, fastigiate, solitary or ternate, canescent-hirtous; bractlets lanceolate, from one-half to two-thirds as long as the calyx or subequaling it, acuminate at the apex, patulous or subpatulous, glabrous except for the long-ciliate margins; flowers odorless or fragrant and sweet-smelling with the odor of vanilla; calyx narrow-prismatic, 5—8 mm.long, green, lightly pubescent on the outside, the rim 5-toothed, the teeth linear-acute or subulate-aristate, very unequal, the lower ones longer; corolla hypocrateriform, medium in size, short-exserted, varying from blue, bluish, bluish-purple, pinkish-blue, or pale rose-blue to violet, pale-violet, bluish-violet, pale lilac-violet, light to rather dark reddish-violet, red-violet, lilac, lilac-purple, pale-lavender, or lavender, sometimes pale-rose [Osten 3523], rose, or red ["coloradas"] to clear-mauve, light vinaceous-gray, or even white [Raimondi 2900, 10694, 10712, Ruiz Leal 1284], its tube about 10 mm. long, slightly longer than the calyx, glabrous on the outside, barbate at the insertion of the stamens within, the limb about 8 mm. wide, the lobes cuneate, emarginate at the apex; anther appendages on the connectives of the upper anthers, very small, subbarbate, much smaller than the anther itself but still manifest, included or slightly exserted; fruiting-calyx turgid, slightly contorted above; fruit included by the mature fruiting-calyx, about 3 mm. long; cocci subterete, obtuse at the apex, alveolate, striate on the dorsal surface, reticulate-areolate above the middle, the commissural surface narrow, white-strigillose; chromosome number: 2n = 10.

This is an extremely poorly understood species. Whether the specific epithet "laciniata" really belongs here, or not, is not even certain. Some authors maintain that it belongs to the taxon now passing as V. berterii (Meisn.) Spreng. Linnaeus' original description is: "laciniatus ERINUS foliis laciniatis. Lychnidea verbena tenuifoliae folio Few. peruv. 3. p. 35. t. 25." The binomial, V. erinoides, has also been widely misinterpreted; Cory (1937) used it for V. tenuisecta Briq. In the horticultural trade it is applied to various species, including V. berterii, V. dissecta, and V. tenuisecta.

The V. laciniata of Kuntze is actually V. dissecta Willd., of Rafinesque is xV. perriana Moldenke, and of Sessé & Mocino is Bouchea prismatica var. laciniata Grenz. Verbena erinoides Auth. is a synonym of V. dissecta; that of Hooker, Hooker & Arnott, Linnaeus [ex Lorentz & Niederlein], Poeppig, and Sprengel are V. berterii; that of H.B.K. and of Willdenow are V. ciliata; and that of Chodat is in part V. calliantha and in part V. storeoclada. The name, V. erinoides Chod., is given by me in Lundell, Fl. Texas (1942) and the spelling "V. crinoides Lam." in various publications, by error as synonyms of V. tenuisecta. Verbena geraniaefolia Hort. is a synonym of V. tenera Spreng.; V. odorata Desf. is Lippia javanica (Burm. f.) Spreng., while V. odorata L'Hér. is Lippia alba (Mill.) N. E. Br. The Lychnidea names of Feuillée are sometimes regarded as synonyms of V. berterii, as, for instance, by me in my Résumé Suppl. 2 (1960), but actually are the basis of Linnaeus' *Erinus laciniatus* and therefore must go wherever Linnaeus' name goes. But whether Feuillée's plant actually was what is now passing as *V. laciniata* or was actually what is now called *V. berterii* is not yet certain. Alcibiades Santa Cruz, however, in 1938 reports that at Talca, Chile, our plant is still called "sandia lahuen", as was the plant of Feuillée. It would seem best, therefore, to keep the nomenclature as it is now accepted. The type is said to be from Peru -- "Habitat in Perú" -- by some authors, but Feuillée states that it came from Chile.

The color plate by Boynton in Addisonia 7: pl. 230 (1922), labeled as *V. erinoides* actually represented *V. tenuisecta* Briq., as does also the color plate in Everett's work (1960) labeled as *V. laciniata*. Some of the other illustrations cited above may also be *V. tenuisecta* -- one cannot always be certain from the characters shown on small illustrations.

The type of *V. pulcherrima* and *V. geraniifolia* is *Haage & Schmidt 5921*, taken from material cultivated at Erfurt, Germany. Vilmorin's *V. pulcherrima* seems to be nothing more than a new name for *V. erinoides* Lam., with which Vilmorin admits that his plant is conspecific. Walpers (1845) reduces *Lychnidea Verbenae tenuifoliae folio* Feuill. and *Erinus laciniatus* L. to synonymy under *V. aubletia* L., but such a disposition of these names is manifestly absurd. Johnston (1929) affirms that the *V. erinoides* of Philippi (1860) is actually *V. atacamensis* Reiche. The "*V. laciniata* sens. lat." of Johnston actually includes *V. aristigera* S. Moore, *V. berterii* (Meisn.) Schau., and *V. dissecta* Willd., while that of P. C. Standley includes *V. cochabambensis* Moldenke and *V. fasciculata* Benth., species that have nothing whatever to do with this complex. Hayek (1908) says "Verbena *erinoides* Lam., Ill., I. p. 17 (1791), ist wahrscheinlich identisch mit *Verbena Berterii* (Meisner) Schauer, da ja der Autor die Pflanze aus Peru anführt. Es scheint daher zweckmässziger, die südbrasilianische Pflanze as *Verbena Selloi* Spreng. zu bezeichnen." Schauer (1851) says "Planta brasiliensis ab hortensi annua differt caulis indumento breviori magisque hirto neque piloso-hirsuto, bracteis calyce duplo brevioribus, corollis minoribus." Sanzin (1919) claims that *V. mendocina* R. A. Phil. is conspecific with what he calls *V. erinoides*. He states that its characters, as seen by him on Philippi's original material, are intermediate between *V. erinoides* and his *V. erinoides* var. *glandulifera* [now known as *V. dissecta* f. *glandulifera* (Sanzin) Moldenke]. It seems probable that Sanzin's *V. erinoides* is actually *V. dissecta*. Neal (1948) reduces *V. erinoides* to *V. pulchella* Sweet, but the plants to which she refers (examined by me) are actually *V. tenuisecta*. Regel (1879) places *V. multifida* Hort. (as well as *V. sabini* Hort.

and V. tenera Spreng.) in the synonymy of V. pulchella.

Ruíz & Pavon's V. multifida seems to be nothing more than a new name for Erinus laciniatus L., which they cite as a synonym. They also cite the common name "sandia-laguen", but the specimen which they illustrate came from Concepcion, Chile. The "Index Kewensis" reduces their name to V. erinoides Lam. Sandeman 103, cited hereinafter by me as V. occulta f. alba Moldenke, is a perfect match for their illustration and was collected at an altitude of 11,000 feet at Tarma, Junin, Peru, in June of 1938. It is described as a low-growing herb, with very viscid leaves and white flowers, growing in full exposure to the sun on a mountainside.

Briquet (1904) has the following to say: "On a souvent confondu avec les V. tenuisecta, dissecta et tenera une espèce voisine, la V. laciniata (L.) Briq. à laquelle nous croyons utile de consacrer les notes suivantes:.....Cette espèce a été basée par Linné sur une plante décrite sous le nom de Lychnidea, etc. dans le Journal de Observations physiques, etc. de Feuillée (III, 35 et 36) et figurée sur la planche XXV, fig. 1. Au sujet de la partie de cette plante, l'auteur dit: 'Je trouvai cette plante dans les campagnes du royaume de Chily, à 38 degres 28 minutes de hauteur du Pôle austral.' La figure représente très exactement le port d'une verveine à corolle de coleur incarnat assez commune au Chili et qui differe totalement des V. tenuisecta et V. tenera par ses feuilles cuneiformes à la base, pinnatilobées, à segments bien plus larges. Feuillée dit la tige 'parsemée d'un petit velu blanchâtre qui rend sa couleur d'un vert blanchâtre." Cette tige est en effet complètement hérissée de poils étalés bien plus denses encore que dans le V. dissecta, tandis que les V. tenuisecta et tenera ont un indument apprime. Le calice est anguleux, a angles saillants entièrement hérissé de poils étalés mélangés avec des glandes stipitées plus ou moins abondantes. Les dents calicinales, conniventes à la fin, sont courtes et triangulaires-lanceolées. Nous ne connaissons cette espèce - impossible à confondre avec celles des plaines transandines lorsqu'on l'a comprise - que du Chili (nombreuses prouvenances in h. Delessert) et du Perou (Bonpland in h. DC.). Elle est indiquée, il est vrai, par Schauer dans le Bresil meridional en général, et en particulier, dans l'État du Minas-Geraes, mais nous nous demandons si ces indications ne sont pas dues à des confusions?" It is probable that Briquet's confusion stems in part from a variant numbering of the sketches in Feuillée's work — V. laciniata is figure 2 on plate 25; V. peruviana (which Briquet's description fits very well) is figure 3.

Walpers (1845) describes five varieties of V. erinoides, but fails to give them nomenclatural designation: "α Foliis ovato-lanceolatis inciso-serratis vix trifidis; β Foliis profunde trifidis subtripartitisve, laciniis incisis, ultimis ovatis lanceolatisve (Rz. et Pav.) — [Poepp. Coll. pl. Chil. no. 159!]; γ Foliis tripartitis, laciniis inciso-pinnatifidis, ultimis lineari-oblongis acutis. -- V. multifida β. contracta Bot. Regist. t.

1766. — *V. Sabini* Hort. — Sweet, Brit. flow. gard. (2 Ser.) IV. t. 347; δ Foliis bipinnatifidis, segmentis paucis linearibus elongatis vel etiam foliorum segmentis anguste linearibus; ε Foliis bipinnatifidis, segmentis linearibus brevibus, bracteis plerumque calce longioribus. -- An specie diversa? -- Crescit in Chili, Peruvia, in Mexico (foliorum laciniis acuminatis) et in Brasilia meridionali." His third variety is discussed by me under *V. laciniata* var. *contracta* (Lindl.) Moldenke. The Mexican plants to which he refers are certainly not conspecific with the rest of the material and are probably *V. teucriifolia* Mart. & Gal.

Briquet (1904) says "Schauer a rattaché dubitativement au *V. laciniata* (*V. erinoides*) deux plantes qui en sont probablement différentes: les *V. Selloi* Spreng. (*Schuttlevorthia Selloi* Walp.) et *V. Sabini* Sweet. -- Le *V. Selloi* est décrit par Sprengel (Syst. veg. II, 750) comme ayant des tiges hispides, des fascicules floraux pédonculés hirsutes et des segments foliaires linéaires aigues très entiers. Ces indications, en particulier les dernières, ne cadrent pas avec le *V. laciniata*: elles s'appliqueraient mieux au *V. dissecta*. Mais Walpers attribue à la plante de Sellow des corolles deux fois plus courtes que le calice (op. cit. p. 13)! Ce caractère, qui ne se retrouve dans aucune autre espèce de la section, achève de rendre le *V. Selloi* entièrement obscur: c'est un type qui ne pourra être élucidé que par l'examen des originaux."

Gay (1849) lists two varieties of his *V. erinoïdes*, which he distinguishes as follows: "α *erecta* — ramis plus minus abbreviatis; foliis confertis.....β *prostrata* — ramis elongato-repentibus, debilibus; foliis remotis, superioribus tripartitis; spicis saepe ternatis." The first of these is probably what is now called *V. laciniata* var. *contracta* (Lindl.) Moldenke.

Verbena laciniata has been found by collectors on the interandine highlands and sandy fields, on open hillsides and puna, in full exposure to the sun on mountainsides, on sandy plains, on grassy northwestern slopes, in sandy places and stony open places, on dry pampas and open rocky slopes, in dry and gravelly ground, in sandy and volcanic soil, on dry or dry desert slopes, and in the *Opuntia*-*Baccharis* zone, at altitudes of 1165 to 4350 meters, blooming in every month of the year, and fruiting in January, April to June, August, September, and November. Common and vernacular names reported for it are "cutleaf verbena", "*Erinus*-like vervain", "mamitac ttoccaynin", "margarita morada", "moss verbena", "piedra quaranga", "porque es rastrera", "prettiest vervain", "sandia-laguen", "sandia-lahuen", "sandia lahuen", "Santa Lucia", "schönstes Eisenkraut", "verbena", "verbena a la roja", "verbena azul", "verbene quaranga", "verveine á fleur d'Erine", "verveine à porte d'Erine", "verveine élégante", "verveine erinoïde", "verveine érinoïde", "yerba del incordio", and "yerba meona". "Moss verbena" is the name recommended by "Standardized Plant Names".

Herbarium material has been abundantly misidentified and distributed under such names as V. aubletia L., V. berterii (Meisn.) Schau., V. chamaedryfolia x erinoides Osten, V. crinoides Lam., V. diffusa Willd., V. dissecta Willd., "V. nr. elegans", V. erinoides Hook., V. erinoides L., V. inflata H.B.K. [by I. M. Johnston!], and V. microphylla H.B.K.

On the other hand, the Herb. Mus. Bot. Berol. s.n. [1840] and Lorentz 1053, distributed as V. laciniata or one of its synonyms, are actually V. aristigera S. Moore; Buchtien s.n. [8.IX.1895], Miers s.n., and R. A. Philippi 1298 are V. berterii (Meisn.) Schau.; Galeotti 736 is V. ciliata Benth.; Venturi 4, 1930, 2303, 2838, 3579, & 5264 are V. dissecta Willd.; Hieronymus s.n. [4.XI. 1876] is V. glandulifera Moldenke; Venturi 2898, 4063, 4607, & 8356 are V. lilloana Moldenke; Cook & Gilbert 549 and F. L. Herrera s.n. [Cuzco, July 1923] are V. microphylla H.B.K.; Safford s.n. [Independencia, Oct. 24, 1886] is V. pulchella Sweet; Claude-Joseph 2177, W. H. Harvey s.n. [Coquimbo, July—August 1856], and Morong 46 & 1126 are V. sulphurea D. Don; Ruíz Leal 3419 & 4258, 1284, 3627, & 5130 are V. sulphurea var. intermedia Kuntze; H. H. Bartlett 19862, Berro 4323, Herb. Herter 79174, Herter & Strahl 181, Jörgensen 1737, Osorio 199, Osten 2748, Rosa Mato 322, and Wilkes s.n. [Rio Negro, Patagonia] are V. tenera Spreng.; Archer 4609, L. H. Bailey s.n. [Aug. 4, 1922], s.n. [Aug. 10, 1924], s.n. [July 23, 1925], s.n. [Aug. 7, 1925], & s.n. [Cambridge, August 6—12, 1929], Bailey & Bailey 7737, H. H. Bartlett 19862, Brinkman 744, Britton, Britton, & Boynton 8296, Burdick 24, Castellanos s.n. [Valle de los Reartes, Dec. 15, 1919], Garnier 615, J. G. Gilmore 1792, Goode 145, Hartling s.n. [N. Y. Bot. Gard. Cult. Pl. 42722], Herb. Meisner s.n. [20 Jul. 1837], Herb. Osten 13675, 15290, & 20415, Herter s.n. [Paysandú, Sept.—Oct. 1907], Jörgen 2470, Jörgensen 2465, Marcus 1962, McCann s.n. [9-15-36], H. N. Moldenke 1084a, N. Y. Bot. Gard. Cult. Pl. 42722, Parks & Cory 22734 & 22735, Pastore & Troncoso 984, P. O. Schallert 251 & s.n. [April 29, 1941], Small, Mosier, & Matthaus 12778, E. C. Stewart 683, Teas s.n. [Houston, June 1926], Teisseire s.n. [Colonia, 1913], R. E. Torrey s.n. [Amherst, Aug. 4, 1942], and Valeur 448 are V. tenuisecta Briq.; Venturi 2651 is V. tomophylla Briq.; and Venturi 949 & 3677 are V. venturii Moldenke.

Balls reports that the species makes "loose mats to several feet across where plants intertwine, growing chiefly among thin turf and against rocks on dry open slopes in poor rocky sandy soil." Steyermark describes it as having "stems hanging down clay banks". Ragonese & Covas (1947) describes it as a "Hierba perenne, de flores violáceas, común en los terraplenes de los caminos, baldíos, cultivos, etc." Jörgensen says that it is abundant at La Ollada. Cabrera (1945) says "Hierba perenne, con tallos rastreros y hojas profundamente bipinnatisectas, con segmentos lineales. Flores azules, dispuestas en espigas cortas en el extremo de los tallos. Vive en la América Austral. Común en la estepa climax." Gay (1849) comments "Especie muy comun en los cerros de la Republica [Chile] y usada como aperitiva, diuretica y emenagoga; se emplea igualmente para apaciguar el ardor de la orina y para purgaciones. Sus hojas menos profundamente partidas y con lobulos anchos y muy cortos lo mismo las bracteas la distinguin muy bien de sus conjeneres."

Reiche (1910) emphasizes the fact that the bractlets are "la mitad tan largas como el cáliz" and "los apéndices de las anteres mui cortos e inclusos en el tubo." He asks "En V. multifida...... las anteres se han dibujado sin apéndices, por omision?" As to its distribution, he says "Planta del Perú, Bresil, de la Arjentina i de Chile; aquí desde el Norte hasta la Araucanía; tambien en las cordilleras bajas. V. multifida fué descrito de Concepcion."

Haage & Schmidt (1898) describe their V. erinoides — based on their no. 5919 — as "purpurviolett, reichblühend," while Park (1963) describes it as "12 inches [tall?]", with purple flowers, and offers 100 seeds for 25 cents, 200 for 45 cents. Mattoon (1958) tells us that the species is offered to the horticultural trade by Vaughan's (New York & Chicago), Sutton & Sons (Reading), Thompson & Morgan, Pearce (Moorestown, New Jersey), and Saier (Dimondale, Michigan).

Covas & Schnack (1945) discuss the length of the pistil in relation to the size of the pollen-grains. Peck (1937) offers "Violet", "White", and "Mixed" varieties to the trade, and calls the species "moss verbena". In 1962 his price was 100 seeds for 25 cents (his no. 2062). West reports that his no. 8115 had "flowers white to lilac-purple". Schauer in A.DC., Prodr. 11: 555 (1847) says that V. teucriifolia Mart. & Gal. is related to this plant "sed glabritie foliisque minoribus minus laciniatis mox tamen profunde incisis diversa", while on page 554 of the same work he says that V. elegans H.B.K. "V. erinoidis quodammodo accedens, sed corolla magna jam satis distincta." The specific epithets of V. erinoides and V. selloi are often uppercased.

Walpers (1845) places this species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia with 10 other species. Perry (1933) places it in her list of "Doubtful or Little-Known Species" and says "This species has established itself in several places [in the United States]. It belongs to a South American species-complex needing critical study to determine accurately its real identity". The plant to which she refers is V. tenuisecta Briq., not V. laciniata.

The Hicken, Sert. And. 65 reference given above is often dated "1922", but as far as I am able to determine is more correctly dated 1923. The Loud., Hort. Brit. Suppl. 2: 680 (1839) reference cited above is often credited to W. Baxter, apparently in error. The Feuill., Journ. Obs. Phys. Côtes Orient. (1725) reference mentioned several times on preceding pages is cited by Schauer (1851) as "Feuill. Hist. Peruv. Chil." and by Linnaeus (1753) as "Few. peruv." The original publication for *Erinus laciniatus* is sometimes given as page "879" in error, while Poiret gives it as "Sp. Pl. 3. 177". The Bot. Reg. 21 reference is sometimes misdated "1836".

The *Weydahl 160* collection, cited below, may have come from either Cotopaxi or Pichincha, Ecuador, as the locality of collection lies directly on the border between these two provinces. Osten identified his *no. 3523* as *V. chamaedryfolia* x *erinoides* and affirms that he found it growing among these two species. He notes that it had large pale-rose flowers. Most of his other collections so determined by him are cited by me under *V. dissecta*.

In Offic. Org. Malayan Agri-Horticult. Assoc. Kuala Lumpur (1940) *V. laciniata* is said to be cultivated in Malaya. Troncoso (1937) says "La he visto con mucha frecuencia en los jardines y parques de la Capital y alrededores......Según SCHAUER,...esta especie es anual, carácter en que difieren los ejemplares que he podido observar en cultivo. Por esta razón, bien podría tratarse de *V. tenera* SPR., especie muy afín a la anterior, y que dado lo sintético de las diagnosis originales me ha sido imposible diferenciarlas. Problema que me queda por resolver."

Hegi (1927) says of the plant to which he applies the name *V. erinoides*: "soll die Menstrationen fördern."

Schauer (1847) cites collections of Martius, Riedel, and Sellow from Minas Gerais, Brazil, and Bonpland and Meyen collections from Peru. In his 1851 work he cites a Sellow collection from Rio Grande do Sul, Riedel from São Paulo, and Martius from Minas Gerais. Walpers (1843) cites *Herb. Willdenow 11137* and *Poeppig 159* and affirms that the species grows at Lake Titicaca, Peru. The "Bot. Reg. t. 1766" which he cites is actually var. *contracta* (Lindl.) Moldenke. Hayek (1908) cites Wacket and Wettstein & Schiffner collections from São Paulo; Herrera (1941) cites his *nos. 18* and *3442* and *Hicken s.n.* [1903] from Cuzco; Raimondi (1943) cites his *10703* from Arequipa, *10712* and *10757* from Ancash, *7373* from Cajamarca, and *2900* and *10694* from Province undetermined, Peru; Cabrera (1945) cites his *no. 7948*; Augusto (1946) cites a Sellow collection from Perto de S. Inácio, Rio Grande do Sul, *Herter s.n.* from Uruguay, and *Augusto & Edésio s.n.* from Bananeiras. Ragonese & Covas (1947) cite *Rosetti, Covas, & Ragonese 3795*. Lorentz & Niederlein (1881) cite a "*V. laciniata* L." from Río Negro, Argentina, which may apply to this species or to *V. berterii* (Meisn.) Schau. Acevedo de Vargas (1951) cites the following Chilean specimens: Santiago: *Collector undesignated s. n.* [X.1882] (Sg—42469, Sg—68404); *Looser 4222* (Sg—67501); *R. A. Philippi s.n.* [XI.1855] (Sg—54760). Llay-llay: *Collector undesignated s.n.* [IX.1863] (Sg—68405). Valparaíso: *Collector undesignated s.n.* (Sg—68406); *Germain s.n.* [Quillota] (Sg—54754).

Antofagasta: *Collector undesignated s.n.* [Paposo] (Sg—42476). Santiago: *Collector undesignated s.n.* [Salto de Conchali, 1976] (Sg—54737).

Covas & Schnack (1944) distinguish *V. laciniata* from some of its closest relatives as follows:

1. Stems erect or suberect, not creeping.
    2. Entire plant covered by a dense pubescence of mixed simple and glanduliferous hairs; leaves tripartite-pinnatilobate... *V. perakii.*
    2a. Entire plant covered by a sparse pubescence composed only of simple hairs; leaves pinnatisect...........*V. mendocina.*
1a. Stems creeping, rooting at the base and ascending at the tips.
    3. Mericarps 2 mm. long.
        4. Bractlets one-third as long as the calyx; spikes not elongating after anthesis........................*V. dissecta.*
        4a. Bractlets more than one-half as long as the calyx; spikes elongating after anthesis...............*V. santiaguensis.*
    3a. Mericarps more than 3 mm. long.
        5. Corolla glabrous outside; glandular anther-appendages subcylindric, scarcely visible from the outside or included; pubescence composed of hairs appressed to the epidermis... *V. laciniata.*
        5a. Corolla pubescent outside; glandular anther-appendages much compressed, plainly exserted; pubescence composed of erect or oblique hairs..........................*V. parodii.*

Rümpler (1873) says of *V. laciniata*: "Brasilien. — Einjährig. — Steifhaarige, stark verzweigte Pflanze mit liegenden, später aufrechten, gegen 30—50 Centimeter hohen Aesten. Blätter gegenständig, am Grunde keilförmig, dreitheilig oder doppelt-halbgefiedert, mit linienförmigen, spitzen, ganzrandigen oder kaum gezähnten Lappen. Blumen violettroth, in wenig verlängerten doldenförmigen Aehren; Kelch mit pfriemlichen Zipfeln, welche länger sind, als das den Kelch begleitende Deckblättchen; Blumenkrone mit ausgerandeten Lappen. Diese Art wirt gleich der Art Nr. 1 [*V. canadensis*] kultiviert: ihre Blumen sind sehr zahlreich und erscheinen von Juni bis Oktober in reicher Folge. Sie ist hauptsächlich zur Bildung kleiner Gruppen und zur Ausstattung der Rabatten geeignet."

In all, 97 herbarium specimens, including the types of some of the names involved, have been examined by me.

Citations: ECUADOR: Azuay: *Steyermark 53729* (N). Chimborazo: *Asplund 6862* (Lu, S, W—1930933), *20463* (S); *Fagerlind & Wibom 799* (Lu, S), *837* (S); *Hartweg 1351* (Lu, N); *Mille 40* (N, W—1121424, W—1188646); *Penland & Summers 466* (N); *Rimbach 175* (W—1544715), *423* (Mi, N, S); *Rose & Rose 22312* (N, W—1021979). Cotopaxi: *Weydahl 160* (S). Pichincha: *I. Holmgren 967* (Gg—354867, S, W—2059951). Tunguragua: *Asplund 20147* (S); *Böcher, Hjerting, & Rahn 97* (S); *A. S. Hitchcock 21739* (N, W—1196493); *F. C. Lehmann 112* (Bm, W—1323146); *Pachano 155* (W—1044636);

Steyermark 54853 (N, S, W--1901701). Province undetermined: André 3609 [Alto de Guaillabamba] (N); Spruce 5065 [In Andibus Ecuadorensibus] (Lu, N). PERU: Ancash: Ferreyra 7333 (Ss). Arequipa: Ellenberg 182 (Ut--115386b). Ayacucho: Ferreyra 7216 (W--2028320). Huancavelica: Rauh & Hirsch P.375 (Z). Junin: Macbride & Featherstone 1260 (W--1474584); R. W. Pearce s.n. [Palca] (Bm). La Libertad: López Miranda 1544 (S); J. West 8115 (Ca--565221). Lima: Asplund 11322 (Gg--403668, S, W--2224408); J. Ball s.n. [Chicla, Aprili 21, 1882] (C, W--1323080); Diers 962 (Ko); Ferreyra 6502 (N); Killip & Smith 21619 (N, W--1356780), 21754 (N, S, W--1356893); Macbride & Featherstone 678 (N, N, W--1830560). Puno: P. Aguilar F.2 (Ok). Department undetermined: Mathews 1048 [Peruvia interiore] (Bm, M). BRAZIL: Rio Grande do Sul: A. R. Schultz 701 (N). State undetermined: Sellow s.n. [Brasilia] (Br). BOLIVIA: La Paz: Buchtien 758 (V). Oruro: Hammarlund 123 (N, S); Kuntze s.n. [Oruro, 14/3/92] (W--702211). Province undetermined: Julio 133 [La Granja] (W--1192719). URUGUAY: Osten 3235 (Ug), 3523 (Ug), 8723 (Ug), 8726 (Ug). CHILE: Bío-Bío: Pfister 2177 (N). Concepcion: Barros Valenzuela 876 (N); Junge 971 [Looser 4030] (N), 1805 (Ba). O'Higgins: F. W. Pennell 12237 (N). Santiago: Alcibiades Santa Cruz s.n. [circa mons Caracol, X.1934] (Ba); Looser 4032 (N). Talca: Alcibiades Santa Cruz s.n. [1938] (Ba). Valparaíso: Garaventa 2672 [Looser 4023] (N); Gillies s.n. (T); Looser 4031 (N). Province undetermined: Dusén s.n. [ad Lotam urbem, 10.X.1896] (Lu); C. Gay 792 (N); Herb. Gray s.n. [Talcaraque] (C); Herb. Mus. Nac. Santiago 1 [Condes] (N). ARGENTINA: Jujuy: Balls 5984 (W--1777774). Mendoza: Ruíz Leal 13812 bis (Rl); Sanzin s.n. [Ruíz Leal 1413] (N). Salta: T. Meyer 12088 (Gg--353269, N). Tucumán: Schreiter s.n. [Cumbre Alta; Herb. Osten 72196] (Ug). CULTIVATED: New York: R. H. Ward s.n. [Troy, July 1868] (Ur). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 10 (N).

VERBENA LACINIATA var. CONTRACTA (Lindl.) Moldenke, Phytologia 3: 426. 1951.

Synonymy: Verbena multifida var. contracta Lindl. in Edwards, Bot. Reg. 21: pl. 1766. 1835. Verbena erinoides Willd. apud Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825 [not V. erinoides Auth., 1959, nor Hook., 1934, nor Hook. & Arn., 1959, nor L., 1959, nor Lam., 1791, nor Poepp., 1847, nor Spreng., 1830]. Verbena erinaides Willd. ex Lindl. in Edwards, Bot. Reg. 21: pl. 1766, in textu. 1835. Verbena multifida β contracta Lindl. ex Sweet, Brit. Fl. Gard. 7 [ser. 2, 4]: pl. 347. 1836. Verbena erinoides β contracta Schau. in A. DC., Prodr. 11: 553. 1847. Verbena erinoides α erecta C. Gay, Hist. Fis. Chile Bot. 5: 10. 1849.

Bibliography: Lindl. in Edwards, Bot. Reg. 21: pl. 1766. 1835; Sweet, Brit. Fl. Gard. 7 [ser. 2, 4]: pl. 347. 1836; Walp., Repert. Bot. Syst. 4: 31. 1845; Schau. in A. DC., Prodr. 11: 553. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 10. 1849; Sweet, Ornament. Fl. Gard. 1: pl. 48. 1854; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 297. 1904; Stapf, Ind. Lond. 6: 429 & 430. 1931; Moldenke, Phytologia 3: 426 & 467. 1951; Moldenke, Biol. Abstr. 25: 3051. 1951; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2211. 1951; Moldenke, Résumé 223, 364, 370, & 472. 1959; Moldenke, Résumé Suppl. 3: 14, 29, & 37 (1962) and 4: 5, 6, & 15. 1962.

Illustrations: Lindl. in Edwards, Bot. Reg. 21: pl. 1766 [in color]. 1835; Sweet, Ornament. Fl. Gard. 1: pl. 48 [in color]. 1854.

This variety differs from the typical form of the species in it more compact growth, the stems more or less abbreviated, and the leaves crowded.

Schauer (1847) describes the variety as follows: "foliis tripartitis, laciniis inciso-pinnatifidis, ultimis lineari-oblongis acutis" but includes V. sabini Sweet in its synonymy. It is doubtful whether the leaf characters which he gives really apply to this variety. Briquet (1904) says "Quant au V. multifida var. contracta Lindl. ...... dont Schauer a fait son V. erinoides β contracta, c'est évidemment, d'après la figure, une forme alpine réduite du V. laciniata." The Lindley, Bot. Reg. reference given above is often dated "1836", but apparently should be 1835. Gay (1849) describes this plant "ramis plus minus abbreviatis; foliis confertis". Lindley affirms that it is native to the "Alps of Chile and Mendoza", and calls it "Dwarf purple vervain"

VERBENA LACINIATA var. SABINI (Sweet) Moldenke, Phytologia 3: 426. 1951.

Synonymy: Verbena erinoides var. sabini Sweet, Brit. Fl. Gard. 7 [ser. 2, 4]: pl. 347. 1836. Verbena sabini Hort. ex Sweet, Brit. Fl. Gard. 7 [ser. 2, 4]: pl. 347, in syn. 1836. Verbena multifida sabini D. Don ex G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839. Verbena sabini Sweet ex Schau. in A. DC., Prodr. 11: 553, in syn. 1847. Verbena sabiniana Hort. ex Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 297. 1904. Verbena erinoides sabinii D. Don ex Stapf, Ind. Lond. 6: 429. 1931. Verbena laciniata var. sabinii Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2211. 1951.

Bibliography: Sweet, Brit. Fl. Gard. 7 [ser. 2, 4]: pl. 347. 1836; Walp., Repert. Bot. Syst. 4: 31. 1845; Schau. in A. DC., Prodr. 11: 553. 1847; Regel, Gartenfl. 28: 372--373. 1879; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 296--297. 1904; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Phytologia 3: 426 & 467. 1951; Moldenke, Biol. Abstr. 25: 3051. 1951; Moldenke, Résumé 223, 364, 373, & 472. 1959; Moldenke, Résumé Suppl. 3: 29, 37, 38, 40, & 41. 1962.

Illustrations: Sweet, Brit. Fl. Gard. 7 [ser. 2, 4]: pl. 347 [in color]. 1836.

This variety differs from the typical form of the species in being more dwarf in habit, denser in growth, more glabrous, and with rich-purple corollas.

Briquet (1904) says "Le *V. Sabini* Sweet.....est représenté dans nos collections par des échantillons cultivés sous ce nom au jardin de Paris (ann. 1836, *Verbena Sabiniana*): ils appartiennent à une forme presque identique au *V. pulchella* Sweet et peuvent être rattachés an *V. tenera* Spreng." The original publication by Sweet is often dated "1838", but appears to be more correctly dated 1836. The "Hort. Brit. Suppl." reference listed above is sometimes credited to W. Baxter, apparently in error. G. Don says of the variety "This is identical with *V. multifida* var. *contracta* Lindl." Regel (1879) places *V. sabini* Hort. as a synonym under his *V. pulchella* "Spreng.", where he also places *V. multifida* Hort. and *V. tenera* Spreng.

VERBENA LANDBECKI R. A. Phil., Linnaea 33: 194. 1864.

Synonymy: *Verbena lamdbecki* R. A. Phil. ex Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 57, sphalm. 1951.

Bibliography: R. A. Phil., Linnaea 33: 194. 1864; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Reiche, Fl. Chile 5: 285 & 287. 1910; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 68. 1948; Moldenke, Alph. List Cit. 3: 687 & 813. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 198. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 56—57. 1951; Moldenke, Résumé 122 & 472. 1959; Moldenke, Résumé Suppl. 3: 14 (1962) and 4: 17. 1962.

Perennial plant, about 25 cm. tall, grayish-hispid, many-stemmed; leaves decussate-opposite, sessile, more or less semicircular in outline, 1.5—2 cm. long, many-parted, bearing leafy twigs in their axils, the segments linear, obtuse at the apex, revolute along the margins; spikes terminal, short-pedunculate, many-flowered; bractlets awl-shaped, slightly shorter than the calyx; calyx about 8 mm. long, its rim with 5 short triangular teeth; corolla lilac or blue, its tube about 1 cm. long, the limb 8 mm. wide, the 5 lobes cuneate and emarginate; fruit unknown.

The type of this very rare species was collected by Christian Ludwig Landbeck near Choapa, Acancagua [Coquimbo, according to Acevedo de Vargas], Chile, in January, 1863, and is deposited in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. The species has been found at altitudes of 1200 to 1350 meters, in flower in January and October. Thus far, only 2 herbarium specimens and 3 phototypes have been examined by me.

Reiche (1910) says of it "Mui parecida a *V. erinoides* o *V. Berterii*." Acevedo de Vargas (1951) cites the following Chilean specimens: Coquimbo: *Landbeck s.n.* [I.1863] (Sg—54672—type), *s.*

n. [Concumen, 1863] (Sg--54736, Sg--68372). Field Mus. 17425 (Sg). She notes that "La foto del Herb. Berlin, distribuida par Field Mus. Nat. Hist. 17422, no es V. lamdbecki. En nuestro herbario museal ha sido confundida con V. laciniata." The Macbride photograph to which she refers actually is of a cotype of V. intercedens Briq.

Citations: CHILE: Aconcagua: Landbeck s.n. [Choapa; Macbride photos 17425; Herb. Mus. Nac. Hist. Nat. Chile 54672] (Kr--photo of isotype, N--photo of type, N--photo of isotype). Coquimbo: Biese 1875 (N). Province undetermined: Claude-Joseph 4085 [Bureo] (W--1342397).

VERBENA LASIOSTACHYS Link, Enum. Hort. Berol. 2: 122. 1822.

Synonymy: Verbena prostrata R. Br. in Ait., Hort. Kew., ed. 2, 4: 41. 1812 [not V. prostrata Benth., 1959, nor G. Savi, 1802]. Verbena rostrata Felt, Bull. N. Y. State Mus. 200: 181, sphalm. 1917. Verbena lasiostachya Link ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947. Verbena prostrata Ait. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena lamberti Spreng. ex Moldenke, Résumé 368, in syn. 1959 [not V. lamberti Ker, 1827, nor Penny, 1832, nor Sims, 1820]. Verbena lasiostachys var. prostrata (R. Br.) Wall ex Moldenke, Résumé 368, in syn. 1959. Verbena leptostachya Winblad ex Moldenke, Résumé Suppl. 3: 39, in syn. 1962. Verbena prostrata Greene ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. Verbena prostrata A. Br. ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. Verbena lasiostachys var. lasiostachys [Raven], Aliso 5: 336. 1963.

Bibliography: G. Savi, Soc. Ital. Mem. Mat. & Fis. 9: 349, pl. 7. 1802; R. Br. in Ait., Hort. Kew., ed. 2, 4: 41. 1812; J. Sm. in Rees, Cycl. 36: no. 24. 1817; Steud., Nom. Bot., ed. 1, 874. 1821; Link, Enum. Hort. Berol. 2: 122. 1822; Reichenb., Hort. Bot. pl. 64. 1825; Spreng. in L., Syst. Veg., ed. 16, 2: 749. 1825; Reichenb., Iconogr. Bot. Exot. 1: xiv & 48, pl. 64. 1827; Sweet, Hort. Brit., ed. 2, 418. 1830; Hook. & Arn., Bot. Beech. Voy. 156 (1833), 383 (1838), and 484. 1841; Walp., Repert. Bot. Syst. 4: 22 & 32. 1845; Schau. in A. DC., Prodr. 11: 547. 1847; Jepson, Erythrea 1: 12. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Richter, Calif. Agr. Exp. Sta. Bull. 217: 983 & 1017. 1911; Felt, Journ. N. Y. Ent. Soc. 20: 150--151. 1912; M. Armstrong, Field Book West. Wild Fls. 435. 1915; Felt, Bull. N. Y. State Mus. 200: 181. 1917; Smiley, Monthly Bull. Dep. Agric. Calif. 11: 203. 1922; Pellett, Am. Honey Pl., ed. 2, 354. 1923; Jepson, Man. Flow. Pl. Calif. 859, fig. 807. 1925; Seymour, Host Ind. Fungi N. Am. 587. 1929; Stapf, Ind. Lond. 6: 430 & 431. 1931; Perry, Ann. Mo. Bot. Gard. 20: 243, 248, 261, 290--293, 355, & 356. 1933; Junell, Symb. Bot. Upsal. 4: 11, 12, 14, 15, 19, 171, & 210, fig. 20. 1934; L. H. Bailey, List Florists Handl. Verbenac. mss. 1935; Munz, Man. So. Calif. Bot. 437. 1935;

Dermen, Cytologia 7: 162. 1936; Perry, Rhodora 38: 272. 1936; Moldenke, Prelim. Alph. List Invalid Names 48. 1940; Worsdell, Ind. Lond. Suppl. 2: 486. 1941; Eastwood, Leafl. West. Bot. 3: 71. 1941; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4:17--19. 1942; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 2, 15, 18, 74, & 101. 1942; Jepson, Fl. Calif. 3 (2): 381--382, fig. 420. 1943; Bowerman, Flow. Pl. Ferns Mt. Diablo 72. 1944; San Dimas Exper. Forest Herb. & Symb. List 21. 1944; Schnack & Covas, Darwiniana 6: 470. 1944; Moldenke, Phytologia 2: 70 & 115. 1945; H. K. Sharsmith, Am. Midl. Nat. 34: 355. 1945; Darlington & Janaki Ammal, Chromosome Atl. 270. 1945; Moldenke, Alph. List Cit. 1:3, 6, 42, 51, 74, 103, 113, 130, 135, 143, 154, 157, 159, 191, 193, 197, 208, 209, 220, 221, 245, 251, 268, 269, 279, 280, & 285. 1946; G. L. Fisher, Am. Bot. Exchange List. 1946; Moldenke, Phytologia 2: 326 & 348. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 25 & 26. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Pellett, Am. Honey Pl., ed. 4, 420. 1947; Moldenke, Castanea 13: 113. 1948; Moldenke, Alph. List Cit. 2: 356, 360, 401, 413, 438, 451, 455, 465, 467--469, 471--474, 476--480, 482, 483, 488, 489, 494, 495, 513, 520, 523, 525, 526, 528, 536, 538, 570, 571, 577, 584, 587, 593, 595--597, 606, 612, 617, 629, & 634 (1948), 3: 658, 700, 703, 717, 720, 736, 738, 755, 756, 767, 770, 774, 775, 779, 785, 794, 800, 803, 816, 825, 831, 833, 841, 843, 850, 852, 871, 948, 950, 953, 963, & 976--978 (1949), and 4: 979--981, 989, 1104, 1119, 1126, 1137, 1138, 1140, 1151, 1155, 1167, 1170, 1173, 1174, 1176, 1197, 1207, 1216, 1217, 1223--1227, 1229, 1230, 1232, 1236, 1243--1245, 1247, 1248, 1252, 1253, 1288, 1290, & 1292. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 14. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 3, 4, 27, 33, 164, & 198. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Moldenke, Phytologia 3: 451, 467, & 468. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 127, 131, & 132. 1952; Moldenke, Phytologia 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 2, 3: 127, 131, & 132. 1958; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Am. Midl. Nat. 59: 353, 354, & 361. 1958; Moldenke, Résumé 5, 6, 32, 33, 39, 223, 368, 372, 373, & 472. 1959; Moldenke, Résumé Suppl. 2: 13 (1960), 3: 8, 9. 29, 39, & 40 (1962), 6: 11 (1963), and 7: 9. 1963; Gleason & Cronquist, Man. Vasc. Pl. 581. 1963; Raven, Aliso 5: 299, 302, & 336. 1963.

Illustrations: Reichenb., Hort. Bot. pl. 64 [in color]. 1825; Reichenb., Iconogr. Bot. Exot. 1: pl. 64 [in color]. 1827; M. Armstrong, Field Book West. Wild Fls. 435. 1915; Smiley, Monthly Bull. Dep. Agric. Calif. 11: 203. 1922; Jepson, Man. Flow. Pl. Calif. fig. 807. 1925; Junell, Symb. Bot. Upsal. 4: fig. 20. 1934; Munz, Man. So. Calif. Bot. 437. 1935; Jepson, Fl. Calif. 3 (2): fig. 420. 1943; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 132 (1952) and print. 2, 3: 132. 1958.

Diffuse and sparsely villous or villous-hirsute annual or perennial, strongly pungent, sometimes to 1.3 m. tall and equally wide-spreading, more usually semi-decumbent or prostrate, much branched from the base; stems at first erect or ascending, usually 3--12 dm. tall, at length spreading and diffusely branched, sparsely villous; leaves decussate-opposite, mostly brunnescent in drying; leaf-blades oval or broadly ovate to oblong-ovate or oblong, 4--10 cm. long, obtuse or acute at the apex, cuneately attenuate at the base into the margined petiole, coarsely and irregularly serrate-dentate with apiculate teeth, incised, or laciniately lobed, the lower ones commonly 3-parted or -divided, the venation appressed above, more or less prominent beneath, both surfaces mostly soft-pubescent or pilose to pilose-strigose or villous, somewhat rugulose above, but not scabrous; spikes terminal, solitary or more often loosely paniculate, dense before anthesis, becoming much elongated and open in fruit, 5--43 cm. long, slender, densely flowered, whitish-hirsute throughout, the flowers and fruits mostly imbricate; bractlets lanceolate-subulate, 1/3 to 1/2 as long as the calyx, villous and sometimes finely glandular; flowers small; calyx 4--5 mm. long, villous and often finely glandular, subtruncate, the distal end connivent above the schizocarp, the teeth subulate; corolla varying from blue, bluish, or pale-blue to pale-lavender, deep-lavender, purplish, purple, or violet, its tube a little longer than the calyx, glabrate or very sparsely pubescent on the outer surface, the limb 3--5 mm. wide; cocci oblong-triquetrous with a convex back, 2--2.5 mm. long, slightly thicker at the distal end, raised-reticulate above, striate below, often with the striations fading out toward the base, the commissural face more or less muricate, approximately reaching the tip of the nutlet; chromosome number: n = 7, 2n = 14.

This common and rather perplexing western species has been collected in dry fog-swept shrubby hills, brushy hills and hillsides, and steep or dry hillsides, in wet places as well as in dry ground, on flats along riverbanks, in 2--3 inches of muddy water on muddy shores, in dried freshwater marshes, in canyons and on canyon floors, in washed gravel and slide rock and sand near tide line, in pinewoods and dry washes, at the base of foothills and at the edge of woods, in waste places and moist ravines, on flats and dry sunny flats, in seeps at the base of ocean cliffs, near creek beds, in woods and pine woods, on damp sunny south slopes, along roadsides, railroad tracks, and stream banks, in low areas near rivers, on creek bottoms and gravel bars, along rivers especially near the ocean, in stony river flood beds, in marshes and valleys and at the borders of marshes, in hillside meadows, on sand dunes, growing on silt or shale, in granite, sandy, or sandy loam soil. It has been described as common in the Transition Zone and an inhabitant of the Upper Sonoran Zone, usually in dry open hill country, from sea-level to altitudes of 2995 meters. It has been collected in anthesis from March to October and in December, and in fruit from May to October and in December. Johnston reports it as "common" in wet places in the San Antonio Mountains; Balls says "plants occurring spontaneously in artificial streams in moist heavy soil with Mimulus cardinalis Dougl."

Ewan states that this species is frequent in the moist soil of backwater channels in Los Angeles County and in dry grassy clearings in Baccharetum with Navarretia and Gnaphalium in Contra Costa County, California. Harrington calls it "a bush about 3 feet tall." The Dudley s.n. [June 18, 1905] collection bears a label which avers that the flowers are "deep lavender, pale lavender, or on some plants white" — the white ones are by me regarded as f. albiflora Moldenke, which see. Culbertson 4210 is a mixture with V. abramsi Moldenke. J. D. Randall 422 in the Dudley Herbarium has fasciated spikes. The Ogden s.n. [Ventura, July & Aug. 1892] and L. S. Rose 39140 collections have the calyx slightly smaller than is usual for the typical form of this species and may possibly represent var. septentrionalis Moldenke. Draper 25, distributed as this species (at least in the Britton Herbarium), is actually Marrubium vulgare L. in the Lamiaceae.

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BOOK REVIEWS

Alma L. Moldenke

"Wild Flowers of America", edited by H. W. Rickett, 471 pp., 400 color plates. Crown Publishers, New York City; 3rd printing. 1963. $15.

This book is a wonderful means of making the famous M. V. Walcott life-size native wild flower plates of the Smithsonian Institution available in a new printing to all aficionados of our wild flora and of naturalistic art. There are some additional plates by D. F. Platt executed in much the same style and so blending harmoniously in this presentation. The paintings are natural appearing, graceful and scientifically accurate. Reprinting of the original plates has automatically resulted in a small loss of clarity of line. For the most part the colors are precisely reproduced. Plates 70 and 71 of the moccasin flower have too much blue and too little pink in the corollas. Plates 149 and 150 of the bladder pod have too much light blue and too little green in the foliage. Plate 243 of willow herb has too much of brown tones instead of magenta pink in the flowers. Plate 320 has beauty berry fruits of an unnatural red instead of a wide range of shades from pale through medium violets and blues.

The introduction was prepared by an eminent botanist and provides a helpful explanation of the nature of common and scientific plant names, a useful glossary, ready identification charts, a good index, and a fine short text describing the species, genus and family of the plants depicted and their geographic range. The scientific classification uses the names originally on the plates instead of some newer taxonomy that might well have been added.

"Tree-Sort Guide", by J. E. Forester, 155 pp. or cards. Crown Publishers, New York City; illustr. 1963. $4.95

In today's world of I B M machines and push buttons these pocket-sized perforated cards and a sorting needle may become as often used as the book type of key to trees. The common and scientific names and the illustrations are taken from previously published excellent work of the U. S. Forest Service. The mostly dichotomous key leads to easy and accurate identifications. The cards are protected with a good plastic case.

"Look at a Flower", by A. O. T. Dowden, 120 pp., illustr. Thomas A. Crowell Company, New York City. 1963. $4.50

This charmingly and copiously illustrated book is the work of a gifted botanical illustrator and has an older juvenile or simple amateur level. The scientific accuracy is vouchsafed by careful checking before it went to press by outstanding authorities. The information on flower structure, function, and classification is very clearly given in word and picture.

"The Complete Guide to North American Trees", by C. C. Curtis and S. C. Bausor, 342 pp., illustr. Collier Books Inc., New York City. 1963. $.95 paper back.

The immediate ancestor of this pocket-sized paper back book is the now depleted hard cover larger sized version of 1943; and this one, in turn, is derived from the also depleted but formerly much used and admired "A Guide to the Trees" of 1925 and from the pen of the senior author.

The original work of Dr. Curtis was limited locally to the northeastern part of our country and adjacent Canada. Dr. Bausor's task involved the addition of similar text material (which Dr. Curtis had intended to incorporate before his death) for the southern and western parts of our country, so that now the whole area of the continental United States and Canada is covered.

The keys lead to easy and accurate identifications; the brief descriptions of genera and species are clear-cut and interesting; both scientific and common names are given along with the authorities for the former; the line drawings — all 350 of them — are diagnostically accurate and natural in appearance. Introduced and cultivated trees and borderline arborescent shrubs are not included.

It is good to have this fine work, initiated by Dr. Curtis, again available for carrying in one's pocket on local field trips in different areas of our continent, and for the home and school library.

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CERTAMEN MELASTOMATACEIS VIII.

John J. Wurdack
Dept. of Botany, U.S. National Museum

With the assistance of a grant from the National Science Foundation and logistic help from the Museo de Historia Natural "Javier Prado" in Lima, many of the rare Melastomataceae of Depto. Amazonas, Peru, were collected in 1962. A future paper will complete discussion here begun for the collections. The high-elevation regions showed species with strong Ecuadorian affinities and generally, for the restricted endemics, little relation with the flora of central and southern Peru. In the lowland area, 3000 mm of rain were measured in the first six months of 1962 at the Peruvian road construction camp near the Cascadas de Mayasi; the flora of this moist region along the Marañón from shortly below Pongo de Rentema to Pongo de Manseriche is generally like that of similar areas in Amazonian Ecuador and adjacent Colombian Putumayo. Certainly in Peru, the climate and flora change below (east of) Pongo de Manseriche to that characteristic of Iquitos and other areas of the upper Amazon basin. At the southern extreme of the wet zone, the sharp ecotone from the xerophytic association along the Marañón above Pongo de Rentema is startling and topographically seemingly inexplicable.

Dr. B. L. Turner and Mr. Mike Powell at the University of Texas were able to obtain chromosome numbers for two of the 41 species whose anthers were sent to Austin. The numbers reported by them were *n* = ca. 12-16 for *Miconia centrophora* Naud. (*Wurdack 517*) and *n* = 19 for *Graffenrieda calyptrelloides* Wurdack (*Wurdack 1506*); these apparently are the first familial counts for any of the 2000-odd species of South American Melastomataceae. For *1506*, Dr. Turner reported very small poorly stained chromosomes and for *517*, all meiotic cells with heavily precipitated cytoplasm; he believes that the Melastomataceae are a difficult family cytologically, rather than relatively easy like the Compositae (where he obtained chromosome counts on 58 of 117 vials shipped from Chachapoyas).

AXINAEA MERTENSIOIDES Wurdack, sp. nov.

A. dependenti R. & P. affinis sed glabra et foliis minoribus.

Ramuli sicut folia inflorescentiarum ramique primum sparsissime pulverulenti mox glabrati teretes in nodis stipuliforme incrassati auriculis erectis corneis persistentibus ca. 2 X 4 mm. Petioli 0.5-1 cm; scutum nullum; lamina 4.5-7 X 2-3 cm tenuiter coriacea apice basique acuta, 5-plinervata jugo interiore 0.5-0.7 cm supra basim inserto jugo exteriore debili

inframarginali nervulis laxe reticulatis, ad margines sinuato-serrulata dentibus obtusis ca. 0.5 mm altis et 2-3 mm inter se distantibus. Panicula 6-10 cm longa; flores 4-meri seminutantes glabri pedicellis gracilibus 0.8-1.3 cm longis. Hypanthium (ad torum) 2.6-2.8 X 2.5-2.7 mm; calycis tubus 0.5-1 mm apice truncatus vel vix (ad 0.5 mm) lobatus lobis oblatis apice rotundatis dentibus exterioribus inconspicuis 0.2 mm longis non eminentibus. Petala 12-14 X 8-10 mm asymmetrice obovata apice oblique rotundata vel vix emarginata. Stamina isomorphica; filamenta 4.5 mm longa; antherarum thecae 4.5 X 0.8 mm apice dorsaliter minute uniporosae, appendice dorsali inflata 5 X (lateraliter) 2.7 mm basi 2.9 mm crassa apicem versus ad 1.4 mm constricta apice acuta. Stylus 15 X 1-0.4 mm; stigma 0.4 mm latum; ovarium 4-loculare glabrum apice truncatum; fructus 4-valvatus; semina non visa.

Type Collection: J. J. Wurdack 1467 (holotype US 2404308; isotype USM; 14 isotypes to be distributed), collected in scrub forest along Río Ventilla 1-2 km west of Molinopampa, Prov. Chachapoyas, Depto. Amazonas, Peru, elev. 2350-2400 m, 23-25 July 1962. "Shrub 2-5 m, frequent. Petals pink in bud, purple-blue at anthesis; anthers purple-brown with burnt-orange connective bulb".

The specific epithet refers to the developmental change in petal color, rather like that in the floodplain bluebells of eastern U.S.A. A. glandulosa has a rather sparse tomentum of strongly roughened hairs 0.3-0.5 mm long on branchlets, lower leaf surface veins and veinlets, and inflorescences; the leaf blades are 7-14 X (2.5-) 3.5-7.5 cm. While the correct application of the names A. dependens and A. glandulosa R. & P. is still debatable (with Markgraf's and Eves' applications the same as the Flora Peruviana Vol. 4 plates), for convenience Eves' interpretation has been followed. A recent collection of A. dependens is Hodge 6278 (US), from the Carpish pass in Huánuco; all available flowers on this specimen are 4-merous. Probably, in the Ruiz & Pavón material one of the cucullate rather rigid petals was split in dissection, with a resulting diagnosis of 5-merous flowers. The only other 4-merous species of Axinaea, as treated by Eves, is A. crassinoda Triana, with white to pink-flushed petals; this species is common on the upper slopes of Puma-urcu above Chachapoyas (Wurdack 657 & 789), where the large pendant panicles (up to 5 dm long) give the flowering plants somewhat the aspect of tree wisterias.

AXINAEA NITIDA Cogn.

Wurdack 954, from the jalca zone south of Laguna Pomacocha, Prov. Bongará, Amazonas, is more glabrous than either the Weberbauer type collection or Wurdack 1259 (from the middle eastern Calla-Calla slopes); this collection probably represents the "pure" species, rather than having a slight infiltration of A. tomentosa pubescence genes. No plants of A. tomentosa were seen in the immediate vicinity of No. 954. A. nitida was frequent in all undisturbed jalca zones; a close relative is

A. lanceolata R. & P. (sensu Eves), with quadrisulcate branchlets and deeper hypanthia.

AXINAEA TOMENTOSA Cogn.

Wurdack 1623, from the south side of the Molinopampa-Diosan pass, has very thick leaves with recurved margins, probably a reflection of the open jalca habitat; Wurdack 907, from the forested hills NNW of Laguna Pomacocha, has plane leaves like the previously collected material of Mathews and Weberbauer. Mathews type collection (isotype NY) has slightly more acute leaf blades than other material. Wurdack 1624, from the same zone as No. 1623, is an obvious hybrid with A. nitida, having ovate (rather than ovate-oblong) thinner leaves with marginal serrulations intermediate in size between those of the parents, as well as somewhat attenuated pubescence on leaves, stems, and flowers. The hybrid is slightly closer morphologically to A. nitida; it also resembles in aspect A. weberbaueri Cogn. (isotype US), but has terete to obscurely rounded-quadrate (rather than sulcate-quadrate) branchlets, somewhat longer pubescence, and leaf blades above with veinlets densely raised-reticulate. Only two plants of No. 1624 were seen in a zone abounding in both putative parents. There seems no reason for further burdening Index Kewensis by formal naming of such hybrids, numerically insignificant in natural populations, unless and when the hybrids are to be of utility in horticultural or other fields.

MERIANIA TETRAGONA (Cogn.) Wurdack, comb. nov.

Axinaea tetragona Cogn., Bot. Jahrb. 42: 137. 1908.

Meriania raimondii Mgf., Notizbl. Bot. Gart. Berlin 13: 461. 1937.

Wurdack 1250, from the middle eastern Calla-Calla slopes, has been compared with the type collection of M. raimondii (USM). Macbride's excellent type photograph (F 16905) of the Weberbauer type collection of A. tetragona, plus field observation of the widespread population in Amazonas (seen also throughout the easternmost cordillera zone radiating from Molinopampa), leaves no doubt as to the synonymy. Certainly, the species is best placed generically beside its near relative, M. radula (Benth.) Tr. sensu Macbride (also fairly common in upland Amazonas), with which it shares the feature of ornamental deep red petals. The smaller ovate cordate strongly bullate leaves with glabrous petioles separate M. tetragona from M. tetraquetra.

MERIANIA RUGOSA Mgf.

Two collections (Wurdack 1483, from the Río Ventilla scrub forest west of Molinopampa; Wurdack 1617, from scrub forest north of Molinopampa) have been compared with the Raimondi type collections (USM). Markgraf's petal measurements must have been from a bud; mature petals, partially hidden by a leaf in mounting the Raimondi specimens, are comparable with those of my own flowering collection, 2.5-3.5 X 1.5-2.5 cm. M. rugosa must be a close relative of M. tetraquetra Tr., known to me only by description and photograph; the basally nerved leaves and tetraquetrous branchlets, as well as the smaller flowers, are ample distinctions from M. rugosa.

MERIANIA HEXAMERA Sprague

Macbride had tentatively recorded this Colombian species for the flora of Peru, based on fragmentary material. The current collection (Wurdack 1050, from rainforest between Laguna Pomacocha and Yambrasbamba) seems to confirm this distribution, although the leaves on No. 1050 are only 7-8 cm wide. Cuatrecasas 9139 (US), from Caquetá between Sucre and La Portada, Colombia, in young bud, has also been referred to M. hexamera.

GRAFFENRIEDA CALYPTRELLOIDES Wurdack, sp. nov.

De affinitate mihi incognita sed certe in systema Cogniauxii a G. patenti et G. weddellii Naud. valde distincta.

Rami graciles teretes glabri. Petioli 0.7-1 cm longi glabri; lamina membranacea 4-6 X 1-2.5 cm elliptica basi apiceque acuta vix triplinervata nervis primariis lateralibus cum costa ad basim per 3-7 mm proximis nervis secundariis inconspicuis tertiariis non vel vix evolutis, marginibus exceptis glabra, ad margines inconspicue crenulata et distanter ciliolata. Panicula 5-6 cm longa lataque glabra; flores 5-meri glabri bene graciliterque pedicellati pedicellis plerumque 5-8 mm longis circum medium articulatis et bibracteolatis (bracteolis 0.5 X 0.3 mm) vel non articulatis. Hypanthium (ad torum) 1.5 X 2 mm inconspicue 10-costatum; calycis tubus 0.1 mm altus, lobis interioribus 0.3 mm altis late triangularibus apice apiculatis, dentibus exterioribus 0.3-0.5 mm eminentibus acutissimis. Petala 3.8-4 X 4.2-4.6 mm oblongo-lanceolata apice anguste acuta. Stamina isomorphica; filamenta 1.7-1.8 mm; antherarum thecae 1.5 mm longae, connectivo ventraliter inconspicue (0.1 mm) tuberculato appendice dorsali descendenti 0.3 mm longa hebeti-acuta. Stylus 4.7 X 0.15-0.2 mm; stigma truncatum; ovarium triloculare apice sub lente sparsissime pilis clavatis minutis ornatum; fructus capsularis trilocularis; semina non visa.

Type Collection: J. J. Wurdack 1506 (holotype US 2404311; isotype USM; 3 isotypes to be distributed), collected in scrub forest along Río Ventilla 1-2 km west of Molinopampa, Prov. Chachapoyas, Depto. Amazonas, Peru, elev. 2350-2400 m, 23-25 July 1962. "Shrub 1-2 m, mostly in bud, frequent. Petals white".

Within Graffenrieda, although the aspect of G. calyptrelloides is most like that of G. moritziana Tr. and G. chrysandra (Griseb.) Tr., the Peruvian material totally lacks the hyaline apiculate calyx cone (repturing early and irregularly, the lobes persisting at anthesis) to be found in buds of the Cuban and Venezuelan species; this cone may be an eventually convincing character for transfer of at least these two species to Calyptrella. The general habit of the Molinopampa endemic, especially the tiny well-pedicelled flowers, is rather like that of *Calyptrella tristis* Tr. and *C. gracilis* Tr. The inflorescence of *G. calyptrelloides* is also reminiscent of that of *G. candelabrum* Macbr. That species, however, surely belongs in the *Miconieae*, probably in *Leandra* (but not near the vegetatively suggestive *Miconia eugenioides* Tr.); the 1/5-semi-inferior ovary and baccate fruit (vide *Schultes & Cabrera 15728*) negate placement in *Graffenrieda*. A peculiar feature in *G. candelabrum* is edging of alternate stamen connective dorsal appendages with minute glands.

GRAFFENRIEDA ACIDA Mgf.

Wurdack 1054, from the rainforest between Laguna Pomacocha and Yambrasbamba, is more glabrescent than the Raimondi syntype collections (USM), but otherwise the same. *G. denticulata* (Gleason) L. Wms. is extremely close to *G. acida*, differing only in the more minute pubescence and proportionately wider leaves; both species share the feature of peach-colored (dull orange to buff or dull rose, fide Steyermark) petals which never spread.

CALYPTRELLA GRACILIS Tr.

Graffenrieda parviflora Cogn., Fedde Rep. 8: 1. 1910.

Comparison of Buchtien Bolivian collections with Peruvian and Colombian material indicates a rather widespread species characterized by the presence (usually) of sparse minute (0.3-0.8 mm long) simple hairs along the midvein and sometimes the lateral primaries and even the secondaries on the lower leaf surface. N. Y. Sandwith kindly confirmed the presence of such hairs on *Spruce 4896*, while an isotype (NY) examined by me conformed in other details to the Buchtien syntype (No. *1722*, US) of *G. parviflora*. Other material examined included: Bolivia, *Buchtien 51* (NY), *1115* (NY, US), *1117* (NY, US), *1118* (NY, US) and *Cardenas 1302* (NY), *1306* (NY), *1310* (NY); Peru, Río Marañón, *Wurdack 1964* (US, USM); and Colombia, Caquetá, *Cuatrecasas 8888* (US), *8921* (US), *8961* (US), *9177* (US) and Putumayo, *Klug 1748* (US). Undeniably, *G. moritziana* Tr. and *G. chrysandra* (Griseb.) Tr. are congeneric with *C. gracilis*, but the extended problems involving differentiation of other *Merianieae* from *Graffenrieda* and *Calyptrella* are precautions against wholesale transfers without monography. Thus *Centronia* D. Don (1823) predates *Graffenrieda* DC. (1828) and *Calyptrella* Naud. (1852), while *Meriania* Sw. (1800) would have precedence over all in wholesale lumping.

CENTRONIA EXCELSA (Bonpl.) DC.

C. tunguraguae Blake, Proc. Biol. Soc. Wash. 35: 118. 1922.

There seems no need at present to add to probable future synonymy by describing the variant common on Cerro Yama-Uma above Molinopampa (*Wurdack 1661*), with inflorescence branchlets and hypanthia villous as in *C. peruviana* Macbr., but with lower leaf surface pubescence as in *C. tomentosa* Cogn.-*C. excelsa* and calyptra-beak slightly smaller (ca. 2.5 mm long) than in

C. tomentosa. The Yama-Uma population seems to have exclusively 5-petaled flowers and 6(-7)-celled ovaries; apparently petal number in this complex ranges from 5 to 8 (Rimbach 242) and leaf blades are slightly plinerved (as in C. tomentosa, despite Cogniaux' key) or not. In any event, the Tunguragua material fits well with the C. excelsa element.

DIOLENA PLUVIALIS Wurdack, sp. nov.

D. amazonicae Pilg. et D. boliviensi Cogn. affinis sed hypanthiis non strigosis.

Caulis sublignosus 10-30 cm longus basi radicans sicut petioli primum modice strigulosus pilis ad 1 mm longis rubrotinctis. Folia in eodem jugo satis inaequalia membranacea supra glabra subtus in venis primariis modice vel sparse strigulosa. Folia maiora: petioli 2-5.5 cm; lamina (6-) 10-18 X (3-) 5-10 cm asymmetrice elliptico-ovata apice breviter (per 0.5-1 cm) acuminata basi asymmetrice cordata (5-15 mm) auriculis plerumque imbricatis, (7-) 9-11-nervata nervulis subtus laxe reticulatis margine inconspicue serrulata. Folia minora: petioli 0-2 mm; lamina 0.7-3 X 0.6-2 cm orbiculari-ovata vel oblongo-ovata apice acuta vel vix subabrupte acuminata basi asymmetrice cordulata. Inflorescentia ut in D. amazonica ad 15 cm longa sparse strigulosa; flores 5-meri pedicellis 0.7 mm longis. Hypanthium 3 mm longum ut videtur glabrum (vel ad apicem versus sparsissime strigulosum) sed sub lente densiuscule pilis clavatis rubris ca. 0.1 mm longis obsitum; calycis tubus 0.4-0.5 mm altus, lobis 0.3-0.4 mm altis rotundatis dentibus exterioribus non vel vix (ad 0.3 mm) eminentibus. Petala 5.5-7 X 4-4.5 mm oblongo-obovata apice rotundata. Stamina dimorphica; filamenta 2.8-3.3 vel 2.1-2.6 mm. Stamina maiora: antherarum thecae 1.3-1.5 mm longae, connectivo sub loculis 0.1 mm prolongato cornu dorsali 0.1-0.15 mm eminente appendicibus duabus ventralibus 2.8-3.3 X 0.1-0.15 mm. Stamina minora: antherarum thecae 1.3-1.5 mm longae, connectivo sub loculis 0.1 mm prolongato appendice ventrali vix (0.1-0.2 mm) bilobato. Stylus 3.5-4.5 X 0.7-0.4 mm; stigma vix expansum 0.7 mm latum; ovarium apice in collum 0.5-0.6 mm altum circum stylum protractum; fructus triqueter; semina 0.4 X 0.3 mm minute tuberculata.

Type Collection: J. J. Wurdack 2276 (holotype US 2404447; isotype USM; 7 additional isotypes to be distributed), collected in rainforest on lower northwest slopes of Cerros Campanquiz, Río Marañón just above Pongo de Manseriche, Prov. Alto Amazonas, Depto. Loreto, Peru, elev. 250-350 m, 17 Oct. 1962. "Locally frequent. Petals white".

Paratypes (all at US): Colombia, Putumayo, Río San Miguel near mouth of Río Conejo, Cuatrecasas 10888. Ecuador, Napo-Pastaza: Zatzayacu, Mexia 7076; 8 km southeast of Tena, Grubb, Lloyd, Pennington, & Whitmore 1575.

Both suggested relatives have obviously strigulose hypanthia and less striking leaf dimorphism (the pairs having length ratios mostly 1:2-1:4 rather than ca. 1:6). D. amazonica also has external calyx teeth (including seta) projecting about 1 mm;

D. boliviensis has sparsely fine-strigose (hairs about 2 mm long) upper leaf surfaces, as well as striking plinervation. Along with Pilger, Standley, and Williams, I feel that Diolena and Triolena, as far as the species now known to me are concerned, should be united; however, I have seen neither Cogniaux-cited material nor recent collections of the two generotypes and also would prefer to consider the generic validity of at least Diplarpea and Monolena before disputing the opinions of 19th century monographers.

DIOLENA ALLARDII Wurdack, sp. nov.

D. amazonicae Pilger affinis sed staminum minorum appendicibus bene evolutis.

Humilis ca. 20 cm alta, habitu pubescentiaque ut in D. amazonica. Folia disparilia elliptica supra glabra subtus in venis venulisque modice laxeque strigulosa. Folia maiora: petioli 0.5-1 cm; lamina 8-11 X 3.5-4.5 cm apice per 0.5-1 cm acuminata basi asymmetrice cordata (ad 4 mm) 5-nervata vel vix (ad 5 mm) 5-plinervata margine ciliato-serrulata dentibus 0.5-1 mm altis et 2-4 mm inter se distantibus. Folia minora: petioli 1-2 mm longi; lamina 2.5-4.5 X 1.2-1.8 cm apice acuta basi asymmetrice cordulata inconspicue ciliolato-serrulata. Inflorescentia ut in D. amazonica, ad 7 cm longa; flores 5-meri, pedicellis 1 mm longis. Hypanthium (ad torum) 1.9 X 2 mm modice strigulosum pilis appressis glanduliferis sparse intermixtis; calycis tubus 0.6 mm altus, lobis interioribus 0.6-0.7 mm longis triangularibus, dentibus exterioribus 0.6-0.7 mm eminentibus et seta terminali 0.5-0.7 mm longa armatis. Petala 5 X 2.5 mm elliptica apice hebeti-acuta. Stamina dimorphica; filamenta 2.5 vel 2.3 mm. Stamina maiora: antherarum thecae 0.9 mm longae, connectivo sub loculis 0.1 mm prolongato cornu dorsali imperspicue evoluto, appendicibus duabus ventralibus 1.7-1.8 X 0.1-0.15 mm. Stamina minora: antherarum thecae 0.8 mm longae, connectivo sub loculis 0.1 mm prolongato cornu dorsali 0.1 mm alto appendicibus duabus ventralibus 0.7 X 0.1 mm. Stylus 4.8 X 0.25-0.3 mm basi in ovarii collo 0.4 mm alto immersus; fructus triquetrum, seminibus 0.4-0.45 X 0.3 mm minutissime tuberculatis.

Type Collection: H. A. Allard 20510 (holotype US 1999760), collected "on side of deep ravine at Las Cueras de los pavos on road to Lima," Tingo María, Depto. San Martín, Peru, elev. 625-1100 m, 30 Oct. 1949-19 Feb. 1950. "Flowers white".

Apart from the striking connective difference (the small stamen bilobed appendage being 0.1 mm long), D. amazonica also shows both members of each leaf pair with noticeable petioles (on the smaller leaf when mature at least 5 mm long). None of the other Diolena species whose stamens I have been able to examine (D. calciphila Standl. & Steyerm., D. stenophylla Standl. & Steyerm., D. amazonica Pilger, D. pluvialis Wurdack, D. spicata Triana, D. pileoides Triana) have other than rudiments (up to 0.4 mm long in D. calciphila) of ventral appendages on the small stamens. However, Dr. Gleason's notes indicate that D. purpurea Gleason has appendages similar to those

of D. allardii; vegetatively the Chocó congener is quite different, with reverse-setose stems and appressed-setose upper leaf surfaces.

SALPINGA MARANONENSIS Wurdack, sp. nov.

Ex descriptione et photicone S. ciliatae Pilg. affinis sed foliis margine undulato-denticulatis fructibus maioribus.

Perennis humilis 18-45 cm alta basi lignosa foliis exceptis glabra. Folia in dimensionibus vix anisomorphica (1:1.5) in forma isomorphica; petioli (1.5-) 3-5 cm glabri; lamina 6-15 X 3-7 cm anguste ovata apice sensim (per ca. 1-2 cm) hebeti-acuminata basi late acuta vel anguste obtusa i. s. tenuissima 5-nervata, supra sparse strigosa pilis gracilibus 1.5-2.5 mm longis laxis ca. 1/mm.^{2}, subtus glabra, margine serrulata dentibus 0.2-0.3 mm altis apice rotundatis et uniciliatis ciliis 0.5-0.7 mm longis. Inflorescentia ut in S. ciliata, pedunculo 2-3 cm longo axe florifero 1-3 cm longo (demum ad 4 cm); flores 5-meri; pedicelli 2.5 mm longi. Hypanthium (ad torum) 9 mm longum 10-costatum; calycis tubus 1 mm altus, lobis 3.4-3.8 X 2.7-3 mm ovatis apice vix acuminatis et mucronulatis basi expansis et contiguis. Petala 16-19 X 9-10 mm asymmetrice obovata apice rotundata glabra. Stamina dimorphica. Stamina maiora: filamenta 3.5-3.7 mm; antherarum thecae 6.1-6.4 mm subulatae, connectivo (ad filamenti insertionem) 0.8-0.9 mm prolongato, appendice dorsali cum parte adscendente 2.5-2.7 X 0.6 mm apice rotundata et parte descendente 0.4 mm infra filamenti insertionem. Stamina minora: filamenta 5.5-5.8 mm vix descendentia; antherarum thecae 2.7-2.9 mm, appendice dorsali 4.1-4.6 X 1.1-0.5 mm apice hebete. Stylus 11 X 1-0.5 mm; fructus trilocularis pedicello 3 mm longo corpore 17-20 mm longo; semina 0.6-0.7 X 0.4 mm nigra minute asperula.

Type Collection: J. J. Wurdack 1917 (holotype US 2404357; isotype USM; 5 additional isotypes to be distributed), collected in rainforest on ridge crest of Quebrada Chuivi (above Km 278 of Marañón road), valley of Río Marañón near Cascadas de Mayasi, Prov. Bagua, Depto. Amazonas, Peru, elev. 500-550 m, 10 Sep. 1962. "Locally frequent. Petals pink; anthers yellow with white appendage".

Paratype: Lopez, Sagástegui, & Collantes 4233 (TRP, US), from Campamento Lumba (Montenegro-Nazaret), Río Marañón, Prov. Bagua, Depto. Amazonas, Peru, elev. 450 m, 26 May 1963.

S. ciliata, still known only from Ule's original collection from Cerro de Cumbasso in Loreto, has ovate to rotund-ovate leaf blades with fimbriate-ciliate margins, as well as fruit only 2/3 as large as in S. maranonensis. Both southeast Brazilian species, S. longifolia (Cham.) Tr. and S. margaritacea (Naud.) Tr., with long calyx lobes have much smaller flowers and strongly triquetrous fruiting hypanthia. In general habit, S. maranonensis is like a somewhat depauperate S. secunda DC., differing in greater development of leaf pubescence and the well developed calyx lobes. Generally, material of S. secunda shows calyx lobes 0.5 mm or less high; however, material from the uppermost Amazon

basin (Colombia, *Schultes 3887*; Brazil, *Krukoff 7285*; Peru, Loreto, *Asplund 14255*, *Klug 517*, *Killip & Smith 27148* and *29921*) has calyx lobes 0.8-1 mm long. This material is perhaps subspecifically separable from typical *S. secunda*, but has the extremely sparse foliar pubescence of the typical form, the calyx lobes much wider than long, white small petals, and fruit (including pedicel) only 15-16 mm long.

SALPINGA DIMORPHA (Gleason) Wurdack, comb. nov.

Saccolena dimorpha Gleason, Bull. Torrey Club 52: 373. 1925.

As is evident from the discussion under the preceding species, as well as from Gleason's emendation (Phytologia 1: 37. 1933) of his original description, the genus *Saccolena* is conformable with *Salpinga*, at least as to the generotypes. Other transfers to *Salpinga*, especially from *Macrocentrum*, to accommodate species with dimorphic stamens and blunt erect dorsal appendages (*M. glandulosum* Gleason, *M. pusillum* Gleason) are required; such transfers are deferred until the evaluation of the two groups of *Salpinga* species (with elongate striate-terete fruit and short triquetrous fruit).

MICONIA PUJANA Mgf.

While the first Peruvian record for this species (*Wurdack 1918*, from rainforest on ridge crest of Quebrada Chuivi, Marañón valley near Cascadas de Mayasi, Prov. Bagua, Depto. Amazonas) varies slightly from the original description and the only Ecuadorian specimen available (*Sydow 882*, US), I do not feel inclined toward any subspecific recognition until more Ecuadorian collections are made. The Peruvian population shows leaf blades with cordulate bases and longer more persistent upper leaf surface hairs than the Puyo collection. While Markgraf placed *M. pujana* in Sect. *Amblyarrhena*, its closest relatives known to me are *M. wagneri* Macbr. and *M. rupticalyx* Wurdack in Sect. *Laceraria*; all three species have 4-merous flowers with an apiculate hyaline irregularly dehiscing calyx cone.

MICONIA LAMPROPHYLLA Triana

Previously known only from Colombia, the species has now been collected along the Río Marañón 2-10 km above the mouth of the Río Santiago, Prov. Bagua, Dept. Amazonas, (*Wurdack 2261*). The Peruvian material varies in no way from the more northern specimens.

MICONIA STELLIGERA Cogn.

M. clavistyla Gleason, Bull. Torrey Club 58: 229. 1931.

Williams 373 (NY) shows no specific differences from the many other collections of *M. stelligera* from Amazonian Peru, the leaf blades being only slightly firmer and basally broader than the species median and the pubescence slightly more compact and more persistent (on the lower leaf surfaces); however, these individual features are found in other collections of *M.*

stelligera. In pubescence compactness, the most distinct unit is the population around Pongo de Manseriche (*Mexia 6240*, *Wurdack 2161*); perhaps subspecific recognition will be needed when other collections from the Marañón below the pongo zone or from Amazonian Ecuador are available.

MICONIA UVIDA Wurdack, sp. nov.

Sect. *Miconia*. A speciebus 174-179 Monographiae Cogniauxii differt petalis extus stellulato-puberulis.

Frutex 1-2.5 m; ramuli teretes primum sicut petioli foliorum subtus venae primariae secundariaeque inflorescentia dense stellulato-furfuracei, ramis foliorum venis demum glabratis. Petioli 1-2.5 cm; lamina 8-18 X 2-4 cm lanceolata apice longe graditer angusteque acuta basi acuta chartacea, trinervata (jugo inframarginali debili neglecto) nervis primariis supra ut videtur 2-3 mm plinervatis sed subtus cum costa parallele adnatis nervis secundariis 2-5 mm inter se distantibus supra impressis subtus creberrime elevatis tertiariis supra invisis subtus vix elevatis et laxe reticulatis, supra glabra, subtus in superficie glabra in nervis tertiariis primum modice stellulato-furfuraceae demum glabrata, margine inconspicue undulato-serrulata non ciliata. Panicula 6-8 X 2.5-6 cm oblongo-ovata ramis primariis vix adscendentibus; flores 5-meri sessiles; bracteolae 0.9-1.3 X 0.6-0.8 mm triangulares acutae extus modice stellulato-puberulae persistentes. Hypanthium (ad torum) 2.5 X 1.5 mm sicut calycis lobi extus modice stellulato-puberulum; calycis tubus 0.5 mm altus, lobis interioribus 0.5 mm altis triangularibus acutis, dentibus exterioribus acutissimis lobos interiores aequantibus. Petala alba 2.8-3 X 1.4-1.5 mm asymmetrice obovato-oblonga apice vix emarginata extus dense granulosa et pilis stellulatis minutis appressis modice obsita intus glabra. Stamina in forma isomorphica; filamenta 2.8-3 vel 2.4-2.5 mm glabra; antherarum thecae 2.2-2.4 mm subulatae vix curvatae, connectivo ventraliter sub loculis 0.1-0.2 mm prolongato sed dorsaliter simpliciter cum filamentis articulato. Stylus 5.3-5.5 X 0.3 mm glaber; stigma non expansum; ovarium 3-loculare 1/2-inferum apice conicum truncatum 0.6 mm altum et in collum 0.2 mm altum circum stylum protractum sparse puberulum; fructus immaturus vix 10-costatus.

Type Collection: *J. J. Wurdack 2153* (holotype US 2404416; isotype USM; 10 additional isotypes to be distrubuted), collected at edge of rainforest along Río Marañón just above Pongo de Manseriche, Prov. Alto Amazonas, Depto. Loreto, Peru, elev. 250-300 m, 4-7 Oct. 1962.

Paratype: *Wurdack 2437*, from the same locality, 26-28 Oct. 1962.

Among the satellites of *M. prasina* (Sw.) DC., all of which have either glabrous or granular-puberulous petals, *M. lonchophylla* Naud. and *M. schlechtendalii* Cogn. (especially the latter) are closest to *M. uvida* in leaf shape, but differ greatly in floral particulars. In minute pubescence and leaf venation features, especially in corolla indument, *M. riparia* Triana is a closer relative than the species suggested by Cogniaux' keys. M. riparia has much narrower leaves (to about 1 cm wide), sparsely barbellate nodal hairs (to 0.7 mm long) intermixed with the shorter stellulate or densely barbellate ones, inflorescence either racemose or barely branched at the extreme base, and somewhat smaller flowers; in both species the connective bases are sporadically beset with a very few minute clavate glands. M. riparia is also common along the upper Marañón, growing among river edge rocks where it is frequently flooded during dry-season river rises; M. uvida occupies higher places on slopes which are either unflooded or rarely flooded even during the rainier months.

MICONIA PHLEBODES Wurdack, sp. nov.

Sect. Miconia. M. calvescenti DC. affinis sed foliorum venulis creberrime reticulatis.

Ramuli teretes (i. s. compressi) sicut petioli foliorum subtus venae primariae secundariaeque stellulato-puberuli. Petioli 2.5-5 cm; lamina 20-35 X 12-20 cm elliptica vel ovato-elliptica apice per 2-3 cm subabrupte angusteque acuminata basi late obtusa vel rotundato-truncata membranacea 5-nervata (jugo interiori ca. 3-5 mm supra basim inserto) nervis secundariis rectis supra impressis ca. 5-8 mm inter se distantibus tertiariis supra vix obscuris nervulis creberrime reticulatis areolis ca. 0.2-0.3 mm latis, supra et subtus in superficie glabra, margine integra. Panicula 12-25 X 10-20 cm ramis inferioribus rectis vel vix adscendentibus; flores 5-meri sessiles in ramulorum brevium extremitatibus plerumque pauciglomerati, bracteolis 0.5 mm longis deltoideis inconspicuis caducis. Hypanthium (ad torum) 2.1 mm longum; calycis tubus 0.4 mm altus, lobis interioribus 0.2 mm altis triangularibus basi remotis, dentibus exterioribus inconspicuis acutis non eminentibus. Petala 2 X 1.3 mm obovato-oblonga apice rotundata extus modice granulosa. Stamina vix dimorphica; filamenta 3.5 vel 2.5 mm; antherarum thecae 2.4-2.5 vel 2.3 mm anguste oblongae, connectivo basi per 0.2-0.3 mm subacute bilobato. Stylus 6 X 0.3 mm; stigma expansum 0.7 mm diam.; ovarium 3-loculare 3/5-inferum apice densiuscule furfuraceo-puberulum et in collum 0.1 mm altum circum stylum protractum.

Type Collection: J. J. Wurdack 1965 (holotype US 2404374; isotype USM; 5 additional isotypes to be distributed), collected on left bank of Río Marañón above Cascadas de Mayasi (opposite Km 278 of Marañón road), Prov. Bagua, Depto. Amazonas, Peru, elev. 425-500 m, 12 Sep. 1962. "Shrub 2-3 m, occasional. Petals white.

M. calvescens has somewhat firmer leaves with lax irregular veinlet areoles 0.5-1 mm wide, more definite calyx lobes 0.5 mm high, and cordiform sporadically glandular stamen connective appendages. (Incidentally I cannot see how M. zubenetana Macbr., at least as far as the US isotype is concerned, differs from M. calvescens, other than in a slightly different connective appendage). M. urbaniana Cogn. differs (ex descr.) from M. phlebodes at least in the cordulate leaf bases, large floral

bracteoles, and glandular stamen connectives. Other large-leaved species with essentially basally nerved leaves (M. panicularis Gleason, M. affinis DC., M. planinervia Naud.) all show lax leaf veinlet reticules and well developed calyx lobes. The dense veinlet reticulation is approximated in M. splendens (Sw.) Griseb.; that wide-spread species, however, has firmer definitely plinerved basally attenuate leaf blades and larger flowers.

MICONIA VENULOSA Wurdack, sp. nov.

Sect. Miconia. M. spennerostachyae Naud. affinis, sed petiolis non nectariferis, ramulis foliorum venis primariis subtus hypanthiisque densiuscule stellulato-furfuraceis.

Ramuli primum vix compressi demum teretes. Petioli 1-5 cm; lamina (10-) 15-26 X (5-) 7-16 cm elliptica apice per 1.5-3 cm subabrupte vel graditer acuminata basi late acuta vel anguste obtusa membranacea integra, venatione ut in M. phlebodei. Panicula 8-17 X 3-5 cm; flores 5-meri sessiles in ramulis unilateraliter dispositi, bracteolis 0.7 mm longis triangularibus valde caducis. Hypanthium (ad torum) 2.3 X 1.6 mm; calycis tubus 0.2 mm altus, lobis interioribus 0.15 mm altis vix acutis basi remotis, dentibus exterioribus 0.1 mm eminentibus tuberculiformibus. Petala 2.5 X 1 mm vix obovato-oblonga apice vix retusa extus modice granuloso-furfuracea. Stamina dimorphica glabra; filamenta 2.8 vel 2.1-2.2 mm. Stamina maiora: antherarum thecae 2.5 mm longae oblongo-subulatae curvatae, connectivo ad basim dorsaliter 0.15 mm elevato ventraliter sub thecis ca. 0.3 mm bilobato. Stamina minora: antherarum thecae 2 mm longae connectivo dorsaliter ca. 0.3 mm supra basim minute tuberculato ventraliter base ipse ca. 0.15 mm bilobato. Stylus 6.3 X 0.3 mm glaber; stigma non vel vix expansum 0.3-0.4 mm diam.; ovarium 3-loculare 0.4 inferum, apice libero 0.4 mm alto conico sparse furfuraceo.

Type Collection: J. J. Wurdack 2044 (holotype US 2404391; isotype USM; 6 additional isotypes to be distributed), collected in rainforest along Quebrada Tambillo (opposite Km 280-282 of Marañón road), valley of Río Marañón above Cascadas de Mayasi, Prov. Bagua, Depto. Amazonas, Peru, elev. 450 m, 18 Sep. 1962. "Shrub 4-6 m, occasional. Petals white."

Paratype: P. C. D. Cazalet & T. D. Pennington 5051 (US), from seasonal rainforest 20 km west of Santo Domingo de los Colorados, Prov. Pichincha, Ecuador, elev. 330 m, 17 Oct. 1961. "Undershrub to 15 ft. Fls white in bud, falling early."

M. spennerostachya differs at least in the petiolar (and sometimes laminar) nectaries and glabrous (or nearly so) leaves, inflorescences, and hypanthia (albeit sometimes with a formless appressed puberulence). M. pauciglandulosa Naud. (at least ex descr. and Macbride photo 36000) has obviously plinerved leaves, calyx lobes 0.7 mm high, and definitely glandular connectives. If the nectary character for M. spennerostachya is a constant for species identification, that species is quite variable in both leaf venation and connective gland development. The unilateral ("scorpioid") flower arrangement is more obvious at

anthesis in M. venulosa than in the suggested relatives. Vegetatively, M. venulosa matches closely M. phlebodes; however, the non-scorpioid inflorescence branches, rather acutely bilobed bases of the large stamen connectives, and expanded stigmas separate the latter. In both species, no sign of foliar nectary development was found in the various duplicate specimens.

MICONIA MEDIA (D. Don) Naud. subsp. BOREALIS Wurdack, subsp. nov.

Ramuli novelli sicut petioli non setosi.

Type Collection: J. J. Wurdack 1265 (holotype US 2404277; isotype USM; 6 additional isotypes to be distributed), collected on the middle eastern slopes of Serrania Calla-Calla near Km 416-419 of Leimebamba-Balsas road, Prov. Chachapoyas, Depto. Amazonas, Peru, elev. 2900-3100 m, 9 July 1962. "Shrub 2-4 m, occasional. Corolla white; anthers purple-pink."

Paratypes (all Prov. Chachapoyas, Depto. Amazonas): Wurdack 671, 683, & 790, from upper slopes and summit of Puma-urcu southeast of Chachapoyas, elev. 2700-3150 m, 1-7 Jun 1962; Wurdack 1438, from summit of Cerro Malcabal 3-6 km southeast of Molinopampa, elev. 2850-2900 m, 20 July 1962; "Chachapoyas", Mathews s. n. (NY).

The typical subspecies, known best from Huánuco, has young branchlets, nodes, and petioles sparsely to moderately setulose or short-setose. In both subspecies, the leaves are very obviously (typical) to very obscurely (Wurdack 790; Ruiz & Pavon Herb. Lambert 5087, US) serrulate. The Mathews collection, although unnumbered was annotated by Triana and is probably a duplicate of No. 1282 cited by him (but not by Cogniaux) for M. media. M. brevis Macbr., as noted in the Flora of Peru, is very closely related to M. media, but has flowers only 1/2 as large, as well as coarser leaf veinlet reticulation. The floral dimensions in M. brevis (isotype US) are actually smaller than those given by Macbride; also, Weberbauer 6334 does show tufts of simple hairs in the inner primary vein axils on the lower leaf surface, just as in M. media.

MICONIA MICROPETALA Cogn.

M. setinervia Cogn., Bot. Jahrb. 42: 143. 1908.

There are no differences between Ecuadorian and Peruvian collections, other than the slightly more persistent rufous tomentum and rather less persistent simple cauline hairs in the Loja material. Obviously Cogniaux did not see in M. micropetala mature flowers such as are on one of the Jameson collections (US 600787); his placement of M. setinervia in Sect. Cremanium is correct. The young cauline hairs are caducously gland-tipped, but the lower leaf surface hairs are eglandular. Apart from the Jameson series (US) and Weberbauer 1145, the other more recent collections include: Espinosa 1075 (NY) from Loja, Ecuador; Metcalf 30672 (US) from Puno, Peru; and Wurdack 1065 and 1440 from Amazonas, Peru. In Wurdack 1440, the lower leaf surface hairs are more caducous than usual. M. micropetala generally resembles M. caelata (Bonpl.) DC., which however lacks simple

foliar hairs.

TOCOCA MEXIAE Wurdack, sp. nov.

Sect. Hypophysca. T. spruceanae Cogn. affinis, sed foliis non plinervatis.

Ramuli primum quadrisulcati demum teretes sicut petioli formicariaque dense setosi pilis 3-4 mm longis setis glanduliferis brevioribus sparse intermixtis. Folia omnia vesiculifera; petioli liberi 1.5-2.5 cm; formicaria 1-2 cm longa urceolata in lamina plusminusve 1/2 insidentia; lamina 17-35 X 9-15 cm apice per 1.5-2.5 cm abrupte acuminata basi acuta i.s. tenuiter membranacea, 5-nervata nervis secundariis fere rectis vel vix adscendentibus, supra modice strigosa pilis gracilibus 1.5-2 mm longis et 1/1-1.5 mm^2, subtus in nervis primariis secundariisque modice setosa pilis 1-2 mm longis in nervis tertiariis superficieque sparse setulosa, margine undulato-serrulata et breviciliata dentibus 0.5-1 mm altis et 2-3 mm inter se distantibus. Panicula 12-15 cm longa oblonga densiuscule setosa pilis fere omnibus glanduliferis ca. 2 mm longis, axe centrali robusto i. s. complanato, ramis lateralibus subtus oppositis supra 4-verticillatis axe ca. 1 cm longo apice plerumque bifurcato ramulis plerumque bifloris. Flores 5-meri pedicellis ca. 5 mm longis. Hypanthium (ad torum) 5.8-6 X 3.8-4 mm campanulatum sicut calyx dense setosum pilis 1.5-2 mm longis plerumque glanduliferis; calycis tubus 0.9 mm altus non dilatatus, lobis interioribus vix evolutis 0.2 mm altis rotundatis dentibus exterioribus brevibus crassis setiferis non eminentibus. Petala 7-7.2 X 3.8 mm asymmetrice obovata apice oblique truncata vel vix emarginata dense granuloso-pruinosa extus centraliter juxta costam setis 3-8 glanduliferis 0.6-1.2 mm longis ornata. Stamina isomorphica glabra; filamenta 5.5 mm longa; antherarum thecae 5.5 mm longae oblongae apice ventraliter uniporosae, connectivo dorsaliter basi 0.4 mm elevato. Stylus 11 X 0.8-2.2 mm in basi extrema sparse setosus pilis eglandulosis 1.5 mm longis; stigma expansum 2.7 mm diam.; ovarium 3-loculare 1/2 inferum apice conico 1.5 mm alto setis eglandulosis 1.5-2 mm longis armato.

Type Collection: J. J. Wurdack 2406 (holotype US 2404476; isotype USM; 6 additional isotypes to be distributed), collected on a forested ridge on right bank of Rio Santiago 2-3 km above mouth, Prov. Bagua, Depto. Amazonas, Peru, elev. 300-350 m, 25 Oct. 1962. "Shrub 1.5-2 m, occasional. Petals pink."

Paratype: Ynes Mexia 6363 (US), fruiting, from heights to right of Río Santiago above Pongo de Manseriche, Depto. Loreto, Peru.

T. spruceana has shortly plinerved leaves, larger (2.5-3 cm long) less densely setose formicaria with a more pronounced constriction at the blade base, and mostly eglandular inflorescence hairs (although the Kew specimen, examined by me several years ago, does show a very few glandular hypanthial and calyx hairs). The robust more pubescent forms of T. acuminata Benth. with slightly flaring lobulate calyx limb somewhat resemble T. mexiae in general aspect, but differ in the smaller hypanthia,

externally non-setose petals, and obscurely puberulent (with very minute glandular hairs) ovary apex. The epithet commemorates the best field woman of the neotropics, whose understory collections made at Pongo de Manseriche over thirty years ago have elucidated, along with Tessmann's upper forest canopy sampling, the current material; the paratype was distributed as T. micrantha Ule. Incidentally, the political geography of the Pongo de Manseriche region has placed the lower two kilometers of the Río Santiago in Depto. Loreto and the region further upstream in Amazonas; for the Peruvian Army command administration from Iquitos, the departmental boundary along the crest of the Cerros Campanquiz deviates at Pongo de Manseriche.

TOCOCA CHUIVENSIS Wurdack, sp. nov.

Sect. Hypophysca. Inter sectionis congeneros differt ovario ominino infero.

Ramuli primum compressi demum teretes sicut petioli inflorescentiaque modice vel vix dense setosi pilis plerumque glanduliferis 2-3 mm longis. Folia in quoque jugo vix dimorphica omnia vesiculifera; petioli liberi 0.6-2.5 cm; vesica libera 1-2.2 cm longa vix scrotiformis vel oblonga modice setosa pilis 2-3 mm longis plerumque non glanduliferis; lamina 7-24 X 6-16 cm ovato-elliptica apice per 0.5-1.5 cm abrupte acuminata basi late obtusa vel truncata i.s. membranacea, 5-nervata nervis secundariis fere rectis vel vix adscendentibus, supra vix sparse strigosa pilis 1-2 mm longis plerumque non glanduliferis ca. 1/2 mm^2, subtus in nervis primariis secundariisque modice vel sparse setosa pilis non glanduliferis 2.5-3.5 mm longis in nervis tertiariis sparsissime setosa in superficie glabra, margine integra et densiuscule ciliata setis 1-1.5 mm longis. Panicula 8-15 cm longa ramis oppositis; flores 5-meri (rarissime 6-meri) plerumque pedicellati pedicellis 4-6 mm longis. Hypanthium (ad torum) 5.5 mm longum sicut calycis tubus sparsiuscule setosum pilis 2-3 mm longis plerumque glanduliferis; calycis tubus 1 mm altus limbo vix expanso, lobis interioribus 0.3 mm altis late rotundatis margine minutissime glanduloso-ciliatis, dentibus exterioribus setiferis rotundatis non eminentibus. Petala 8.5 X 7 mm obovato-oblonga apice vix emarginata densiuscule granuloso-pruinosa extus rarissime seta unica armata. Stamina isomorphica glabra; filamenta 5-5.2 mm; antherarum thecae 5.2 mm longae oblongae apice ventraliter uniporosae connectivo dorsaliter juxta basim vix (0.4 mm) elevato. Stylus 11 X 0.7-1 mm glaber; stigma expansum 1.5 mm diam.; ovarium 3-loculare omnino inferum apice ut videtur glabrum sed sparsissime cum glandulis minutissimis clavatis obsitum.

Type Collection: J. J. Wurdack 1920 (holotype US 2404360; isotype USM; 5 additional isotypes to be distributed), collected in rainforest on ridge crest of Quebrada Chuivi (above Km 278 of Marañón road), valley of Río Marañón near Cascadas de Mayasi, Prov. Bagua, Depto. Amazonas, Peru, elev. 500-550 m, 10 Sep. 1962. "Shrub 1-1.5 m, occasional in forest clearings. Corolla pink."

From dissections and Cogniaux' Flora Brasiliensis descriptions, all other sectional congeners have a conical ovary apex; no collection of T. platyphysca Cogn., known only from bud material, has been seen, but at least vegetative features differentiate this species. T. occidentalis Naud. is perhaps the closest relative, but differs in the sparser pubescence and definitely lobed calyx. The general aspect of T. chuivensis is also like a pubescent form of T. guyanensis Aubl. (but with depauperate formicaria), which (despite the ovary apex variability discussed by Gleason) always has the ovary at least partially free.

TOCOCA CAROLENSIS Gleason

Wurdack 1995, from the upper Marañón lowland rainforest, shows beaked calyptrate calyces (on buds) which dehisce above the torus; the calyptra is 5 mm high, with an additional 3 mm beak. On each of 3 flowers examined from the Peruvian material and one flower from the Bolivian isotype (US), there were 6 petals and 12 stamens, with a basally sparsely glandular-puberulous style and 6-celled ovary. A similar beaked rather irregularly and tardily dehiscing calyx is found in T. parviflora Spr. ex Benth. (vide infra) and in minute-flowered species of Miconia Sect. Laceraria. While the calyptrate calyx would suggest Conostegia, the pubescence (especially the glandular hairs) is distinctly tococoid and rather different from the setose species of Conostegia.

TOCOCA FILIFORMIS (Gleason) Wurdack, comb. nov.

Myrmidone filiformis Gleason, Bull. Torrey Club 57: 74. 1930.

All features of the Caqueta species except the minor one of flower-mery impel placement in Tococa. T. filiformis lacks the hypanthial flange (union of external calyx teeth bases) seen in both Myrmidone macrosperma Mart. and M. lanceolata Cogn.; this feature led to Gleason's description of the genus Hormocalyx and his later retraction (and correctly, since the Krukoff type collection shows predominantly 6-merous flowers and also otherwise compatibility with M. macrosperma). Judging from Mexia 6412 and 6428 (distributed originally as T. egensis Naud. and T. longisepala Cogn.), from Rancho Indiana, Iquitos, Peru, there seems no disputing the generic placement of the predominantly 4-merous T. caudata Mgf., and 6-mery does not seem a more important generic criterion. A recent collection of T. filiformis is Cuatrecasas 8802 (US) from Florencia, Caquetá, Colombia; the inflorescences are both lateral and terminal in the Florencia material, with floral dimensions slightly larger than in Gleason's original description. Incidentally, the New York photo of the Woronow & Juzepczuk type shows sparsely setose formicaria and lower leaf surface primary veins sparsely setose just above the formicarium.

TOCOCA PARVIFLORA Spruce ex Triana subsp. MANSERICHENSIS Wurdack, subsp. nov.

A subsp. parviflora differt calycis dentibus exterioribus nullis.

Type Collection: J. J. Wurdack 2092 (holotype US 2404402; isotype USM; 5 additional isotypes to be distributed), collected in high rainforest along Rio Marañón near Teniente Pinglo, just above Pongo de Manseriche, Prov. Alto Amazonas, Depto. Loreto, Peru, elev. 250-300 m, 4-7 Oct. 1962. "Shrub 1-2 m, occasional. Flowers pale pink."

In the typical subspecies, the external calyx teeth are obvious, surrounding the calyptra beak in buds and persisting at anthesis; excellent flowering material of subsp. parviflora in various developmental stages has been collected in Ecuador (Fuller 128, NY). In the closely related T. micrantha Ule (also found in the Marañón rainforest, Wurdack 1891), the calyptra is much flattened and very obscure with no apparent beak; judging from the original description and numerous recent Caquetá collections, T. caquetana Sprague is almost surely a synonym of T. micrantha. The other species in this group, T. variegata Mgf, known to me only from the original description, is evidently distinct from either T. parviflora or T. micrantha.

CLIDEMIA ALLARDII Wurdack subsp. MARANONENSIS Wurdack, subsp. nov.

Inflorescentia compacta pluriflora ramis non evolutis.

Type Collection: J. J. Wurdack 1993 (holotype US 2404380; isotype USM; 4 additional isotypes to be distributed), collected in rainforest along Quebrada Tambillo (below Km 280 of Marañón road), valley of Río Marañón above Cascadas de Mayasi, Prov. Bagua, Depto. Amazonas, Peru, elev. 425-525 m, 14 Sep. 1962. "Shrub 1-2 m, occasional. Young leaves and cauline hairs red-tinged. Corolla white."

Paratype: Wurdack 1994, from the same locality.

While the compact inflorescences (with branches less than 5 mm long) of the Marañón population negate the convenient inflorescence size criterion used for the separation of C. allardii from its near-relatives (Phytologia 7: 241. 1960), the other vegetative features, especially the presence of plumulose hairs, still serve as separating characters. Additionally, C. allardii has leaf bases quite cordate, in contrast to the rounded to insignificantly emarginate bases of C. crenulata Gleason. There are no obvious floral differences between the two subspecies of C. allardii. The Marañón rainforest population has two elements, the paratype having the hairs straw-colored rather than red-tinged. No patent ecologic factor for this color difference could be seen in the field. Judging from herbarium material, these two color forms also exist in the typical subspecies, Cuatrecasas 10569 and 11317 having red-tinged foliage and the other collections cited in the original description pale hairs.

BLAKEA PORTENTOSA Wurdack, sp. nov.

B. pyxidanthus Tr. affinis sed foliis et floribus maioribus calyce distincte lobato.

Rami primum indistincte compresso-quadrangulati demum teretes appresso-furfuracei (indumento indiscreto) et in nodis inconspicue setulosi mox glabrati. Petioli 3-5 cm longi apice supra primum setulosi demum glabrati; lamina 10-20 X 6.5-15 cm late elliptica apice abrupte per 0.5-1 cm hebeti-acuminata basi anguste obtusa vel late acuta coriacea integra, brevissime 5-plinervata jugo interiori 0.3-0.5 cm supra basim inserto jugo exteriori debili ca. 1 mm inframarginali nervis secundariis vix adscendentibus 4-7 mm inter se distantibus nervis tertiariis non evolutis, supra glabra, subtus in nervis secundariis superficieque primum amorpho-squamata mox glabrata in nervis primariis primum sparse longo-setulosa demum glabrata superficie i. s. pallida. Flores in foliorum superiorum axillis (1-) 2-4-aggregati 6-meri glabrati, bracteis omnibus hypanthio brevioribus; pedicelli 1.5-2.5 cm longi robusti; bracteae exteriores 8-10 X 11-13 mm basi 2-3 mm coalitae suborbiculares apice rotundatae extus vix costatae nervis lateralibus invisis; bracteae interiores 12 X 24-26 mm oblatae apice rotundato-truncatae usque ad basim liberae lateraliter ca. 4-5 mm imbricatae margine vix pellucidae. Hypanthium (ad torum) 6.5-7 X 9.5 mm glabrum; calycis tubus 6-6.5 X 20 mm, lobis 2-2.5 X 9 mm apice rotundatis. Petala 27-30 X 17-19 mm oblongo-obovata apice rotundata extus i. s. minute muriculata. Filamenta 13-15 X 3.5 mm; antherarum thecae 8.5 X 3.5-4 X 2.5 mm late hemiellipticae ventraliter ca. 2.5 mm infra apicem minute (0.1-0.15 mm) biporosae connectivo dorsaliter basi 2.5-3 mm elevato acuto. Stylus 18-20 X 2 mm in ovarii cono 1 mm alto insertus; stigma truncatum; ovarium omnino inferum glabrum.

Type Collection: *J. J. Wurdack* *2380* (holotype US 2404470; isotype USM; 7 additional isotypes to be distributed), collected in rainforest on middle north slopes of Cerros Campanquiz at Pongo de Manseriche, right bank of Río Marañón, Prov. Alto Amazonas, Depto. Loreto, Peru, elev. 550-750 m, 22 Oct. 1962. "Woody vine climbing 8 m. Petals apically pink, basally white; anther thecae cream, the connective yellow."

B. *pyxidanthus* (at least as far as *Uribe* *1553*, *Lehmann* *5551*, *Duque* *1568a*, and *Dryander* *2070* show) has leaves and flowers only half as large as *B*. *portentosa*, as well as a truncate or indistinctly undulate-margined calyx; however, the glaucescent-appearing lower leaf surfaces with caducously barbellate primary vein axils and distantly placed secondary veins are as in the Peruvian relative. More distant congeners, all with larger external bracts 15-25 mm long as well as individual specific differences, are *B*. *orientalis* Gleason and its 3 South American relatives (Bull. Torrey Club 72: 387. 1945).

A CHECKLIST OF THE CULTIVATED WOODY PLANTS OF THE ROCHESTER PARKS.

Part I

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It has seemed useful to have in print a listing of what is currently (July, 1963) being cultivated in the arboretum and fruticetum collections now under the administration of the County of Monroe through its Department of Parks. Reflected, in the main, are the former City of Rochester plantings in Highland Park, 108 acres of glacier-deposited mounds and kettleholes of limy sands and gravels, and Durand-Eastman Park, 499 acres of upraised neutral silty-loams deposited in the bottom of a glacial lake and now deeply stream-eroded into sheltering north-south valleys on the south shore of Lake Ontario.

When known, a nursery or other source is given with the year of acquisition for each species or cultivar. In the instance of multiple sources only the oldest is given and the existing plants may not always represent that acquisition. The date, too, may not always indicate the age of present specimens as an active propagation department has been in existence for many years to maintain rare plants. Recent acquisitions are also indicated by (N) to designate plants still in nursery areas. In most cases, these have not been checked for accuracy of naming.

In writing cultivar names, it is ventured in this list to delete the Latin genitive endings of personal names in the interest of making such more recognizable and to their wider use. Contrarily, the compiler of this list retains whenever possible capitalized honorifics, believing in L. H. Bailey's statement that it does a man no honor to de-capitalize him. The currently fashionable turn to de-capitalization brings to mind always the physical limitations of that nightly assistant scribe to Don Marquis, **archy**. In this connection it has been interesting to note the all too frequent appearance of Dodecatheon media.

ABELIA - Caprifoliaceae

Graebneriana	Arnold Arboretum	1912
spathulata	Missouri Bot. Garden	1955

ABELIOPHYLLUM - Oleaceae

distichum	Willowwood	1952

ABIES - Pinaceae

alba	Ellwanger & Barry	1897
a. 'Pendula'		
a. 'Compacta'	Horton Nur.	1958
amabilis	Veitch Nur.	1899
balsamea 'Andover'	Andover, N. Y.	1958
cephalonica	Hicks Nur.	1922
cephalonica X Nordmanniana (Well. #14)	Arnold Arboretum	1923
cilicica	Ellwanger & Barry	1918
concolor	Ellwanger & Barry	1897
c. 'Conica'	Bay State Nur.	1960
c. 'Glenmore'	More	1956
Ernestii		
Fargesii	Arnold Arboretum	1915
homolepis	Veitch Nur.	1906
h. umbellata	Arnold Arboretum	
koreana 'Prostrata'	Holden Arboretum	1956
lasiocarpa	Veitch Nur.	1899
l. arizonica	Veitch Nur.	1906
nephrolepis	Arnold Arboretum	1919
Nordmanniana	Ellwanger & Barry	1902
N. 'Tortifolia'	Westbrook Gard.	1923
Nordmanniana X cilicica (Well. #8)	Arnold Arboretum	1923
numidica (N.)	Barres	1955
procera	Veitch Nur.	1899
p. 'Glauca'	Cottage Gard.	1918
recurvata	V. Gibbs	1911
sachalinensis	Arnold Arboretum	1909
s. nemorensis	Arnold Arboretum	1919
sibirica	Douglas	1905
Veitchii	Veitch Nur.	1899
V. olivaceae	Arnold Arboretum	1918

ACANTHOPANAX - Araliaceae

divaricatus	Arnold Arboretum	1906
Giraldii	Arnold Arboretum	1915
lasiogyne	Farquhar Nur.	1917
senticosus	Regel & Kesselring	1910
Sieboldianus		
Simonii	Arnold Arboretum	1919
Wardii	Farquhar Nur.	1917

ACER - Aceraceae

acuminatum	Arnold Arboretum	1912

ACER, con.

Buergerianum	Arnold Arboretum	1958
campestre	Ellwanger & Barry	
c. 'Nanum'	Willowwood	1958
capillipes	Arnold Arboretum	1921
cappadocicum	Ellwanger & Barry	1919
c. 'Rubrum'		
carpinifolium	Chenault Nur.	1919
circinatum		
cissifolium	Veitch Nur.	1907
crategifolium	Arnold Arboretum	1919
Davidii (N.)		
diabolicum purpurascens	Veitch Nur.	1903
Ginnala	Arnold Arboretum	1902
G. 'Durand Dwarf'	DEP mutation.	
G. Semenovii (N.)	Royal Bot. Gard., Hamilton	1961
grandidentatum	Ellwanger & Barry	1906
griseum	Veitch Nur.	1914
Grosseri	Kew	1953
G. Hersii	Arnold Arboretum	1923
Heldreichii (N.)		
japonicum	Arnold Arboretum	1924
leucoderme	Arnold Arboretum	1902
macrophyllum	Barbier Nur.	1907
micranthum	Arnold Arboretum	1921
Miyabei	Veitch Nur.	1903
Mono	Arnold Arboretum	1906
M. tricuspis	Veitch Nur.	1914
monspessulanum	Barbier Nur.	1907
Negundo	Horsey coll. Ohio	1915
N. pseudo-californicum	Veitch Nur.	1907
N. texanum	Arnold Arboretum	1924
nigrum	Biltmore Nur.	1902
n. ascendens 'Slavins Upright'	B. H. Slavin sel.	
nikoense	Veitch Nur.	1899
Opalus	Arnold Arboretum	1912
palmatum	Biltmore Nur.	1902
p. 'Atrolineare'	Bobbink & Atkins	1923
p. 'Atropurpureum'	Bobbink & Atkins	1923
p. 'Dissectum'	Bobbink & Atkins	1923
p. 'Ornatum'	Bobbink & Atkins	1923
pensylvanicum	Princeton Nur.	1925
platanoides	Chase Bros. Nur.	1919
p. 'Columnare'	Arnold Arboretum	1923
p. 'Crispum'	Moons Nur.	1913
p. 'Erectum'	Type tree in Mt. Hope Cemetary	
p. 'Globosum'	Moons Nur.	1913
p. 'Laciniatum'	Arnold Arboretum	1922
p. 'Palmatifidum'	Arnold Arboretum	1922
p. 'Rubrum'	Ellwanger & Barry	1907
p. 'Schwedler'	Ellwanger & Barry	1907
p. 'S. Crimson King'	Wayside Gard.	1948

ACER, con.

p.'S. Faasens Black'	DeVisser	1959
p. 'Stoll'		
p. 'Undulatum'	Ellwanger & Barry	1907
Pseudo-Platanus		
P. 'Atropurpureum'	DeVisser	1959
P. 'Erectum'	Grootendorst Nur.	1957
P. 'Worlee'	J. Cheal Nur.	1915
Pseudo-Sieboldianum	Arnold Arboretum	1919
rubrum		
r. 'Columnare'		
rufinerve	Arnold Arboretum	1913
saccharinum	Arnold Arboretum	1907
s. 'Laciniatum'	Ellwanger & Barry	1907
s. 'L. Beebe'	Cole Nur.	1958
s. 'Pyramidale'		
saccharum		
s. columnare 'Newton Sentry'	Arnold Arboretum	1922
s. c. 'Temples Upright'	Ellwanger & Barry	1909
s. Schneckii	Arnold Arboretum	1907
senecaensis	Hybrid named by B. H. Slavin	
Sieboldianum	Horton Nur.	1958
Stevenii (N.)	Moscow	1957
tataricum	Ellwanger & Barry	1907
tegmentosum	Arnold Arboretum	1918
Trautvetteri	Spaeth Nur.	1902
triflorum	Arnold Arboretum	1958
truncatum (N.)	Kew	1960

ACTINIDIA - Actinidiaceae

arguta	Spaeth Nur.	1892
chinensis	Veitch Nur.	1907
polygama	Arnold Arboretum	1923

AESCULUS - Hippocastanaceae

arguta	Arnold Arboretum	1911
arnoldiana (N.)	Holden Arboretum	1962
carnea	East Ave. (Lamberton)	1916
c. 'Briot'	Ellwanger & Barry	
discolor	Arnold Arboretum	1913
d. mollis	Arnold Arboretum	1915
glabra	Palmer	1913
g. leucodermis	Arnold Arboretum	1912
g. Sargentii		
Hippocastanum		
H. 'Baumann'		
H. 'Pyramidalis' (N.)	Holden Arboretum	1960
H. 'Umbraculifera'		
hybrida	Arnold Arboretum	1915
mississippiensis	Arnold Arboretum	1922
neglecta pubescens	Arnold Arboretum	1924
n. tomentosa	Ellwanger & Barry	

AESCULUS, con.		
octandra	Arnold Arboretum	1907
o. vestita	Horsey coll., Ohio	1915
parviflora	Ellwanger & Barry	1892
p. serotina		
Pavia	Arnold Arboretum	1921
plantierensis	Ellwanger & Barry	
splendens	Arnold Arboretum	1915
turbinata	Ellwanger & Barry	1907
woerlitzensis	Ellwanger & Barry	
w. 'Ellwanger'	Ellwanger & Barry	
AILANTHUS - Simaroubaceae		
altissima	Arnold Arboretum	1906
a. 'Erythrocarpa' (N.)	Ashkhabad	1960
Vilmoriniana (N.)	Essen	1959
AKEBIA - Lardizabalaceae		
trifoliata		1955
ALBIZZIA - Leguminosae		
Julibrissin 'Rosea'	Arnold Arboretum	1952
ALNUS - Corylaceae		
glutinosa		
incana		
maritima	Barbier Nur.	1902
pubescens		
rugosa		
serrulata	Horsey, Columbus, Ohio	1922
spectabilis		
AMELANCHIER - Rosaceae		
alnifolia	Mulligan, Alberton, Mont.	1961
arborea	Robbins Nur.	1922
canadensis	Spaeth Nur.	1902
florida	W. A. Smith	1962
grandiflora		
g. rubescens	B. H. Slavin sel.	
g. r. 'Robin Hill'	W. A. Smith	1958
laevis		
sanguinea		
AMORPHA - Leguminosae		
canescens glabrata	Transon Nur.	1892
fruticosa	Heathby, Leroy	1892
f. angustifolia		
f. tennesseensis	Arnold Arboretum	1907
glabra	Arnold Arboretum	1907
AMPELOPSIS - Vitaceae		
brevipedunculata	Parsons Nur.	1892
b. 'Citrulloides'	Veitch Nur.	1892

AMPELOPSIS, con.		
b. Maximowiczii	Barres	1960
orientalis	Veitch Nur.	1892
ANDRACHNE - Euphorbiaceae		
colchica	Arnold Arboretum	1915
phyllanthoides		
ARALIA - Araliaceae		
elata	Arnold Arboretum	1911
e. 'Pyramidalis'	Lemoine Nur.	1902
spinosa	Transon Nur.	1892
ARISTOLOCHIA - Aristolochiaceae		
moupinensis	Veitch Nur.	1914
tomentosa (N.)	Schumacher	1957
ARONIA - Rosaceae		
arbutifolia	Brown Bros. Nur.	1943
melanocarpa	J. Dawson	1892
ASIMINA - Annonaceae		
triloba	Heffron, Brockport	1923
BERBERIS - Berberidaceae		
aggregata	Arnold Arboretum	1912
amurensis	Spaeth Nur.	1892
a. japonica	Arnold Arboretum	
arido-callida	Arnold Arboretum	1914
aristata	J. Dawson	1892
Bretschneideri	Arnold Arboretum	1911
buxifolia 'Nana' (N.)	Holden Arboretum	1960
canadensis	Arnold Arboretum	1906
chinensis	T. Smith Nur.	1899
circumserrata	Arnold Arboretum	1914
consimilis	Arnold Arboretum	1906
dasystachya	Arnold Arboretum	1912
declinata 'Oxyphylla'	Spaeth Nur.	1892
densiflora Bungeana	N.Y. Bot. Garden	1952
diaphana	Arnold Arboretum	1902
d. uniflora	Arnold Arboretum	1911
dictyophylla	Vassar Coll.	1951
Dielsiana	Arnold Arboretum	1915
durobrivensis	Spaeth Nur.	1892
emarginata	Spaeth Nur.	1892
e. 'Britzensis'	Spaeth Nur.	1892
Gilgiana	Arnold Arboretum	1912
Giraldii	Lemoine Nur.	1918
Julianae	Arnold Arboretum	1915
koreana	G. Landis Arboretum	1960
macracantha	Spaeth Nur.	1892
Meehanii	Meehan Nur.	
mentorensis	Hodenpyl Est.	1949

BERBERIS, con.		
oblonga	T. Smith Nur.	1899
Prattii	Arnold Arboretum	1912
P. recurvata	Arnold Arboretum	
provincialis serrata	Spaeth Nur.	1892
reticulata	Arnold Arboretum	1915
shensiana	Arnold Arboretum	1915
Sieboldii	Arnold Arboretum	1914
Thunbergii	Arnold Arboretum	1906
T. 'Erecta'	Brown Bros. Nur.	1943
T. 'Maximowicz'	Arnold Arboretum	1902
T. 'Minor'	Farquhar Nur.	1917
T. 'Yellowberry'	B. H. Slavin sel.	
Vernae	Arnold Arboretum	1912
verruculosa	Princeton Nur.	1951
virgetorum	Horton Nur.	1958
vulgaris	Ellwanger & Barry	1892
v. 'Atropurpurea'	Ellwanger & Barry	1893
v. 'Lutea'	Backhouse Nur.	1892
Wilsonae	Veitch Nur.	1907
BERCHEMIA - Rhamnaceae		
racemosa	U. S. D. A.	1960
BETULA - Corylaceae		
chinensis	Arnold Arboretum	1919
Ermanii	Grootendorst Nur.	1958
grossa	Arnold Arboretum	1917
lenta	Ellwanger & Barry	1918
Litwinowii (N.)	Wageningen	1961
lutea	Ellwanger & Barry	1918
Middendorffii (N.)	Wageningen	1959
nigra	Meehan Nur.	1915
occidentalis	Arnold Arboretum	1906
papyrifera	Arnold Arboretum	1906
p. commutata		
pendula	Arnold Arboretum	1911
p. oycoviensis (N.)	Kornik	1956
platyphylla japonica (N.)	U. of Br. Col.	1960
p. szechuanica	Morton Arboretum	1951
populifolia	Kelsey Nur.	1918
Raddeana (N.)	Cantonspark	1959
Schmidtii	Arnold Arboretum	1917
BROUSSONETIA - Moraceae		
papyrifera	Brooklyn Bot. Garden	1950
BUCKLEYA - Santalaceae		
distichophylla	G. Landis Arboretum	1961
BUDDLEIA - Loganiaceae		
crispa Farreri (N.)	U. S. D. A.	1961
Davidii	T. Smith Nur.	1899

BUDDLEIA, con.		
stenostachya	Boyce-Thompson	1930
BUMELIA - Sapotaceae		
lanuginosa	Arnold Arboretum	1906
BUXUS - Buxaceae		
microphylla japonica		
m. 'Kingsville Dwarf'	Kingsville Nur.	1950
m. koreana	Arnold Arboretum	1922
sempervirens	Ellwanger & Barry	1892
s. 'Bruns' (N.)	U. S. D. A.	1960
s. 'Flora Place'	Missouri Bot. Garden	1954
s. 'Navicularis'	Transon Nur.	1892
s.'B alkans #9'	Missouri Bot. Garden	1954
CALLICARPA - Verbenaceae		
Bodinieri Giraldii	Arnold Arboretum	1909
dichotoma	Arnold Arboretum	1924
japonica		1930
CALYCANTHUS - Calycanthaceae		
fertilis	Kelsey Nur.	1892
f. laevigatus	J. Dawson	1892
floridus	Arnold Arboretum	1907
CAMPSIS - Bignoniaceae		
radicans	Horsey, Richmond, Ky.	1920
CARAGANA - Leguminosae		
arborescens	Spaeth Nur.	1892
a. 'Lorberg'		
frutex	Dickson Nur.	1892
pekinensis	Arnold Arboretum	1924
pygmaea	Arnold Arboretum	1929
sinica	Spaeth Nur.	1902
sophoraefolia	Arnold Arboretum	1908
spinosa	Spaeth Nur.	1892
tragancanthoides (N.)	Goluchow	1959
turkestanica (N.)	Vacratot	1962
CARPINUS - Corylaceae		
Betulus	Spaeth Nur.	1892
B. fastigiata	Barbier Nur.	1922
B. horizontalis	Barbier Nur.	1911
caroliniana virginiana		
cordata	Arnold Arboretum	1906
japonica	Arnold Arboretum	1912
orientalis	Arnold Arboretum	1911
Tschonoskii	Horton Nur.	1958
Turczaninovii	Arnold Arboretum	1908
T. ovalifolia	Arnold Arboretum	1908

CARYA - Juglandaceae		
aquatica	Arnold Arboretum	1921
carolinae-septentrionalis	Arnold Arboretum	1906
cordiformis	Long Pond, Monroe Co.	1919
Dunbarii	Golah, N. Y.	
glabra	Arnold Arboretum	1906
g. megacarpa	Type tree Senaca Park	
illinoensis	Arnold Arboretum	1902
laciniosa		
Laneyi	Type tree Riverside Cemetary	
ovalis		
o. obcordata		
o. obovalis		
o. odorata		
ovata	Arnold Arboretum	1918
o. ellipsoides		
o. Nuttallii		
pallida	Arnold Arboretum	1914
texana	Arnold Arboretum	1902
t. arkansana	Arnold Arboretum	1918
t. villosa	Arnold Arboretum	1919
tomentosa	Meehan Nur.	1911
CASTANEA - Fagaceae		
mollissima	U. S. D. A.	1915
pumila	Meehan Nur.	1892
CATALPA - Bignoniaceae		
bignonioides	Smith Est., Rochester	
Bungei	Arnold Arboretum	1906
hybrida	Arnold Arboretum	1907
ovata		
speciosa		
CEANOTHUS - Rhamnaceae		
americanus		
CEDRELA - Meliaceae		
sinensis	Arnold Arboretum	1909
CEDRUS - Pinaceae		
libani	Arnold Arboretum	1906
CELASTRUS - Celastraceae		
angulata	Arnold Arboretum	1909
orbiculata	Arnold Arboretum	1920
scandens		
CELTIS - Ulmaceae		
Bungeana	Arnold Arboretum	1912
Douglasii	Arnold Arboretum	1920
laevigata	Arnold Arboretum	1921
occidentalis	Arnold Arboretum	1907

CELTIS, con.		
occidentalis cordata	Arnold Arboretum	1907
pumila	Arnold Arboretum	1902
p. Deamii	Arnold Arboretum	1920
reticulata	Arnold Arboretum	1906
Tournefortii (N.)	N. Y. Bot. Garden	1960
CEPHALANTHUS - Rubiaceae		
occidentalis		
CEPHALOTAXUS - Taxaceae		
Harringtonia drupacea	Veitch Nur.	1899
H. d. 'Fastigiata' (N.)	Holden Arboretum	1955
CERCIDIPHYLLUM - Cercidiphyllaceae		
japonicum	Chenault Nur.	1919
j. sinense	Arnold Arboretum	1914
magnificum	Goteburg	1952
CERCIS - Leguminosae		
canadensis	Ellwanger & Barry	
c. alba	Teas Nur.	1907
chinensis	Meehan Nur.	1892
Siliquastrum		
CHAENOMELES - Rosaceae		
japonica	Ellwanger & Barry	1892
j. alpina	Barbier Nur.	1911
speciosa		
s. 'Alba Cincta'		
s. 'Alba Rosea'		
s. 'Baltz'	Spaeth Nur.	1892
s. 'Candida'	Barbier Nur.	1902
s. 'Cardinalis'	Barbier Nur.	1916
s. 'Eximia'	Transon Nur.	1892
s. 'Falconnet Charlet' (N.)	Morton Arboretum	1962
s. 'Moerloose'	Spaeth Nur.	1892
s. 'Nivalis'	Transon Nur.	1892
s. 'Papaleu'		
s. 'Rubra Grandiflora'	Barbier Nur.	1916
s. 'Sanguinea Plena'	Barbier Nur.	1916
s. 'Sulphurea Perfecta'		
superba 'Cameo' (N.)	Weston Nur.	1962
s. 'Coral Sea'	Wayside Gard.	1949
s. 'Incendie'	Chenault Nur.	1919
CHAMAECYPARIS - Pinaceae		
Lawsoniana	Veitch Nur.	1899
L. 'Allum'	Bobbink & Atkins	1927
L. 'Ellwood'	J. Noble	1950
L. 'Filiformis Compacta' (N.)	U. S. D. A.	1962
L. 'Fletcher'		

CHAMAECYPARIS, con.

Lawsoniana 'Fraser'		
L. 'Tharandtensis Caesia' (N.)	Girard Nur.	1961
nootkatensis	Little Nur.	1897
n. 'Glauca'		
n. 'Glenmore' (N.)		
n. 'Viridis' (N.)	National Arboretum	1962
obtusa	Arnold Arboretum	1896
o. 'Coralliformis' (N.)	Girard Nur.	1962
o. 'Cripps'	Bobbink & Atkins	1923
o. 'Filicoides'	Detmer Nur.	1957
o. 'Gracilis'		
o. 'Gracilis Aurea'		
o. 'Lycopodioides'	J. Noble	1950
o. 'Nana Gracilis'	Kaye Nur.	1951
o. 'Nana Koster' (N.)	National Arboretum	1962
o. 'Tsatsumi'	Elm City Nur.	1919
pisifera	Arnold Arboretum	1896
p. 'Aurea'	Brown Bros. Nur,	1943
p. 'Compacta Variegata'	J. Noble	1950
p. 'Dwarf Blue' (N.)	U. S. D. A.	1962
p. 'Filifera'	Little Nur.	1896
p. 'Filifera Aurea'		
p. 'Plumosa'	Veitch Nur.	1907
p. 'Plumosa Aurea'	Brown Bros. Nur.	1943
p. 'Squarrosa'	Little Nur.	1896
p. 'Squarrosa Intermedia'		
p. 'Squarrosa Nana'	Col. Montgomery	1932
thyoides	Kelsey Nur.	1898
t. 'Andelyensis'	J. Noble	1950
t. 'Ericoides Glauca' (N.)	J. Noble	1950

CHAMAEDAPHNE - Ericaceae

calyculata

CHIMONANTHUS - Calycanthaceae

praecox	Dr. Dye, Szechuan	1948

CHIONANTHUS - Oleaceae

retusus	Veitch Nur.	1892
virginicus	Ellwanger & Barry	1892
v. maritimus	Meehan Nur.	1892

CLADRASTIS - Leguminosae

lutea

CLEMATIS - Ranunculaceae

koreana (N.)	Cluj	1960

CLERODENDRON - Verbenaceae

trichotomum	Meehan Nur.	1899

CLETHRA - Clethraceae

acuminata	BH coll., Kentucky	1950
alnifolia	Ellwanger & Barry	1892
barbinervis	Veitch Nur.	1903

COLUTEA - Leguminosae

arborescens	Ellwanger & Barry	1892
kopetdaghensis (N.)	Vacratot	1962
media	Arnold Arboretum	1924
melanocalyx (N.)	N. Y. Bot. Gard.	1960
persica (N.)	O. E. White Arb.	1961
p. Buhsei (N.)	Ashkhabad	1961

COMPTONIA - Myricaceae

peregrina		

CORIARIA - Coriariaceae

japonica	T. Smith Nur.	1899

CORNUS - Cornaceae

alba 'Gouchault' (N.)	Holden Arboretum	1960
a. 'Westonbirt' (N.)	U. S. D. A.	1962
alternifolia	Curtis Nur.	1925
Amomum		
arnoldiana		
asperifolia	Spaeth Nur.	1892
australis Koenigii	Arnold Arboretum	1914
Baileyi		
controversa		
Dunbarii	Rochester Parks seedling	
florida		
f. 'Pendula'		
f. rubra	Meehan Nur.	1899
f. 'White Cloud'	Wayside Gard.	1949
f. 'Xanthocarpa'	Hicks Nur.	
foemina		
Horseyi	Rochester Parks seedling	
Kousa	Parsons Nur.	1894
K. chinensis	Arnold Arboretum	1922
K. 'Skylands'	Elan Mem. Park	1959
mas	Arnold Arboretum	1902
m. 'Macrocarpa' (N.)	Bucharest	1958
m. 'Violacea' (N.)	Morton Arboretum	1962
obliqua	B.H.Slavin coll., Wisc.	
officinalis	Barbier Nur.	1907
paucinervis	Arnold Arboretum	1909
pumila (N.)	Morton Arboretum	1962
racemosa		
r. 'Slavins Dwarf'	Rochester Parks seedling	
rugosa		
sanguinea		
Slavinii	Rochester Parks seedling	
stolonifera	Veitch Nur.	1892

CORNUS, con.

stolonifera 'Flaviramea'	Ellwanger & Barry	1919
Walteri	Arnold Arboretum	1922

CORONILLA - Leguminosae

Emerus	J. Dawson	1892

CORYLOPSIS - Hamamelidaceae

glabrescens	Arnold Arboretum	1916
pauciflora	Parsons Nur.	1892
spicata	Transon Nur.	1892
Veitchiana	Arnold Arboretum	1916

CORYLUS - Corylaceae

americana	Riverview Nur.	1915
Avellana 'Contorta'	W. A. Smith	1960
A. 'Heterophylla'	Ellwanger & Barry	1892
A. 'Athaldenslebener Lambertsnuss'	C. Vollertsen	1925
A. 'Burchardts Zellernuss'	C. Vollertsen	1925
A. 'Bolwyller'	C. Vollertsen	1925
A. 'Early Globe'	C. Vollertsen	1925
A. 'Gustaus Zellernuss'	C. Vollertsen	1925
A. 'Hempbells Lambertsnuss'	C. Vollertsen	1925
A. 'Kentish Cob'	C. Vollertsen	1925
A. 'Large Globe'	C. Vollertsen	1925
A. 'Red Aveline'	C. Vollertsen	1925
A. 'White Aveline'	C. Vollertsen	1925
chinensis	Arnold Arboretum	1918
colurna	Spaeth Nur.	1892
cornuta	Spaeth Nur.	1892
heterophylla	Arnold Arboretum	1915
maxima 'Purpurea'	East Ave. (Perkins)	1921
Sieboldiana mandschurica		
Vilmorinii		1931

COTINUS - Anacardiaceae

Coggygria	Ellwanger & Barry	1892
C. 'Purpureus'	Transon Nur.	1892
C. 'Rubrifolius'	Wayside Gard.	1949
obovatus		

COTONEASTER - Rosaceae

acuminata	Arnold Arboretum	1906
acutifolia	Spaeth Nur.	1892
a. villosula	Arnold Arboretum	1910
adpressa	Barbier Nur.	1907
a. 'Little Gem'	Mayfair Nur.	1958
ambigua		
apiculata	Arnold Arboretum	1918
bullata	Lemoine Nur.	1912
congesta	Uppsala	1953
conspicua decora	U. S. D. A.	1961

COTONEASTER, con.

Dielsiana	Arnold Arboretum	1909
divaricata	Arnold Arboretum	1910
foveolata	Arnold Arboretum	1910
Franchetii	Barbier Nur.	1907
horizontalis	Lemoine Nur.	1902
h. perpusilla	Dickson Nur.	1907
h. 'Variegata'	Holden Arboretum	1956
h. Wilsonii	Kohankie Nur.	1945
hupehensis	Arnold Arboretum	1916
integerrima	Arnold Arboretum	1906
Lindleyi	Barbier Nur.	1907
lucida	Arnold Arboretum	1920
melanocarpa		
m. laxifolia	Arnold Arboretum	1906
microphylla	Veitch Nur.	1899
moupinensis	Lemoine Nur.	1912
multiflora	Spaeth Nur.	1892
nitens	Kohankie Nur.	1945
obscura	Arnold Arboretum	1914
racemiflora	Spaeth Nur.	1892
r. nummularia		
r. Royleana	V. Gibbs	1917
r. soongorica	Arnold Arboretum	1913
rosea	Arnold Arboretum	1916
rotundifolia	Lemoine Nur.	1917
r. lanata	Transon Nur.	1892
Simonsii	Spaeth Nur.	1892
tenuipes	Arnold Arboretum	1915
tomentosa	Spaeth Nur.	1892
Wardii	G. Landis Arboretum	1960
Zabelii	Arnold Arboretum	1910

CRATAEGUS - Rosaceae

amnicola	Arnold Arboretum	1907
anomala	Arnold Arboretum	1904
apiomorpha	Arnold Arboretum	
aprica	Arnold Arboretum	1907
arcana	Arnold Arboretum	1904
arnoldiana	Arnold Arboretum	1902
aulica	Arnold Arboretum	1904
beata	Arnold Arboretum	1904
blanda	Arnold Arboretum	1904
Brainerdii	Horsey coll., Buffalo	1911
B. asperifolia	Arnold Arboretum	1906
B. scabrida	Arnold Arboretum	1904
Brunetiana	Arnold Arboretum	1904
Calpodendron	Ellwanger & Barry	1904
Canbyi	Arnold Arboretum	1902
celsa	Dunbar coll., Niagara Falls	
coccinioides	Arnold Arboretum	1902
Coleae	Arnold Arboretum	1904
compta	Arnold Arboretum	1905

CRATAEGUS, con.

confinis	Arnold Arboretum	1904
Crus-galli	Ellwanger & Barry	1904
C. Barrettiana	Arnold Arboretum	1926
bellica	Arnold Arboretum	1907
densiflora	Arnold Arboretum	1902
dilitata	Arnold Arboretum	1904
disjuncta	Arnold Arboretum	1904
Dodgei	Arnold Arboretum	1904
Douglasii	Arnold Arboretum	1907
Dunbarii	Arnold Arboretum	1904
durobrivensis	Arnold Arboretum	1914
Engelmannii	Arnold Arboretum	1902
flabellata	Arnold Arboretum	1904
Fontanesiana	Arnold Arboretum	1904
formosa	Arnold Arboretum	1904
Harbisonii	Arnold Arboretum	1902
Holmesiana	Arnold Arboretum	1902
H. chippewaensis	Arnold Arboretum	1904
H. tardipes	Arnold Arboretum	1904
H. villipes	Arnold Arboretum	
Idaea	Arnold Arboretum	
improvisa	Arnold Arboretum	1906
insolens	Arnold Arboretum	1904
integriloba	Arnold Arboretum	1904
irrasa Blanchardii	Arnold Arboretum	1906
Jackii	Arnold Arboretum	1904
Lavallei	Arnold Arboretum	1902
leiophylla	Arnold Arboretum	1904
lemingtonensis	Arnold Arboretum	1904
limaria	Arnold Arboretum	1921
Macauleyae	Arnold Arboretum	1904
Mackenzii bracteata	Arnold Arboretum	1913
macrosperma acutiloba	Arnold Arboretum	1904
m. matura	Arnold Arboretum	1904
m. roanensis		
mollis	Arnold Arboretum	1904
monogyna		
m. 'Stricta'		
nitida	Arnold Arboretum	1902
nuda	Arnold Arboretum	
nudiflora (N.)	Royal Bot. Gard., Hamilton	1961
Oakesiana	Arnold Arboretum	1904
Oxyacantha 'Pauls Scarlet'	Brown Bros. Nur.	1954
O. 'Plena'		
pedicellata	Arnold Arboretum	1904
p. albicans	Arnold Arboretum	1904
p. assurgens	Arnold Arboretum	1904
p. Ellwangeriana	Arnold Arboretum	1904
persimilis		
Phaenopyrum	Arnold Arboretum	1902
P. 'Fastigiata'	B. H. Slavin sel.	
pinguis		

CRATAEGUS, con.		
pinnatifida psilosa		
Porteri	Arnold Arboretum	1904
Pringleii	Arnold Arboretum	1902
pruinosa	Arnold Arboretum	1902
p. angulata	Arnold Arboretum	1904
p. dissona	Horsey coll., Buffalo	1911
p. latisepala	Arnold Arboretum	1904
prunifolia	Arnold Arboretum	1904
punctata	Arnold Arboretum	1904
p. aurea	Arnold Arboretum	1904
regalis	Arnold Arboretum	1904
rivularis	Arnold Arboretum	1902
rotundifolia	Arnold Arboretum	1904
r. aboriginum	Arnold Arboretum	1904
r. Bicknellii	Arnold Arboretum	1904
r. pubera	Arnold Arboretum	1904
saturata	Arnold Arboretum	1904
scitula	B.H. Slavin coll., Chapinville	
signata	Arnold Arboretum	
spathulata	Arnold Arboretum	1920
spatiosa	Arnold Arboretum	1906
stolonifera	Arnold Arboretum	1906
submollis	Arnold Arboretum	1902
succulenta	Arnold Arboretum	1904
s. macracantha	Arnold Arboretum	1904
s. michiganensis	Arnold Arboretum	1904
verrucalis	Arnold Arboretum	
virella	Arnold Arboretum	1904
viridis	Biltmore Nur.	1902
xanthophylla	Horsey coll., Buffalo	1911
CRYPTOMERIA - Pinaceae		
japonica 'Bandai-Sugi' (N.)	Girard Nur.	1962
j. 'Compacta'	van Heiningen Nur.	1914
j. 'Globosa Nana'	J. Noble	1952
j. 'Jindai-Sugi' (N.)	Girard Nur.	1961
j. 'Monstrosa Nana' (N.)	Girard Nur.	1962
j. 'Pygmea' (N.)	Girard Nur.	1961
j. 'Vilmoriniana' (N.)	Girard Nur.	1962
CUDRANIA - Moraceae		
tricuspidata	L. Lipp	1959
CUNNINGHAMIA - Pinaceae		
lanceolata		
CUPRESSUS - Pinaceae		
Bakeri Matthewsii	Morton Arboretum	1950
CYDONIA - Rosaceae		
oblonga		

CYRILLA - Cyrillaceae

racemiflora	Kingsville Nur.	1953

CYTISUS - Leguminosae

austriacus (N.)	U. of Wash. Arboretum	1959
decumbens	Oslo	1958
elongatus	Kew	1951
leiocarpus (N.)	Cluj	1961
Lindemannii	Leningrad	1959
nigricans		1950
praecox	Holden Arboretum	1952
purgans		
ruthenicus (N.)	Leningrad	1960
scoparius	Veitch Nur.	1907
spinescens (N.)	Hann. Muenden	1962
supinus	Smith Coll.	1951

DAPHNE - Thymelaeceae

Burkwoodii 'Somerset'	Wayside Gard.	1952
caucasica	Regel & Kesselring	1910
mantensiana	Holden Arboretum	1955
Mezereum	Ellwanger & Barry	1892
M. 'Alba'		

DAVIDIA - Nyssaceae

involucrata Vilmoriniana	Veitch Nur.	1907

DECAISNEA - Lardizabalaceae

Fargesii	Arnold Arboretum	1919

DEUTZIA - Saxifragaceae

candida	Lemoine Nur.	1914
discolor	Lemoine Nur.	1908
elegantissima 'Conspicua'	Lemoine Nur.	1916
hypoglauca	Arnold Arboretum	1912
kalmiaeflora	Lemoine Nur.	1902
Lemoinei	Ellwanger & Barry	1906
longifolia	Arnold Arboretum	1912
magnifica 'Eburnea'	Lemoine Nur.	1912
m. 'Erecta'	Lemoine Nur.	1914
m. 'Formosa'	Lemoine Nur.	1914
m. 'Insignis'	Lemoine Nur.	1914
m. 'Longipetala'	Lemoine Nur.	1914
rosea 'Grandiflora'	Lemoine Nur.	1902
r. 'Venusta'		
scabra	Lemoine Nur.	1907
s. plena 'Pride of Rochester'	Ellwanger & Barry	1892
Vilmorinae	Lemoine Nur.	1905

DIERVILLA - Caprifoliaceae

sessilifolia	Kelsey Nur.	1907

DIOSPYROS - Ebenaceae		
Lotus	Arnold Arboretum	1913
virginiana	Arnold Arboretum	1913
DIPELTA - Caprifoliaceae		
floribunda (N.)		
ELAEAGNUS - Elaeagnaceae		
angustifolia		1890
montana ovata		
multiflora	Kingsford, Oswego	1914
umbellata	Arnold Arboretum	1906
ELSHOLTZIA - Labiatae		
Stauntonii	Arnold Arboretum	1911
ENKIANTHUS - Ericaceae		
campanulatus	Veitch Nur.	1903
EUCOMMIA - Eucommiaceae		
ulmoides	Arnold Arboretum	1909
EUONYMUS - Celastraceae		
alata	Spaeth Nur.	1892
a. 'Compacta'	Brown Bros. Nur.	1943
a. (Korean form)	Arnold Arboretum	1921
Bungeana	Spaeth Nur.	1892
B. 'Pendula'	Rochester Parks seedling	
B. 'Semipersistens'		
europea	Ellwanger & Barry	1892
Fortunei	Ellwanger & Barry	1892
F. 'Carriere'		
F. 'Colorata'	U. S. D. A.	
F. 'Gracilis'	Spaeth Nur.	1892
F. 'Vegeta'	Swan Pt. Cem., Providence	1910
kiautschovica	Arnold Arboretum	1915
latifolia	Arnold Arboretum	1902
Maackii	Spaeth Nur.	1892
nanus turkestanicus	Grootendorst Nur.	1951
obovatus	B.H. coll., Kentucky	1952
oxyphylla	Arnold Arboretum	1920
sachalinensis (N.)	Cambridge Bot. Garden	1957
verrucosa	Spaeth Nur.	1892
yedoensis	Parsons Nur.	1892
EVODIA - Rutaceae		
hupehensis	Arnold Arboretum	1912
EXOCHORDA - Rosaceae		
Giraldii	Lemoine Nur.	1912
Korolkowii	J. Dawson	1892
racemosa	Farquhar Nur.	1915
r. 'The Bride'	Wayside Gard.	1957

EXOCHORDA, con.		
serratifolia (N.)	Hillier Nur.	1957
FAGUS - Fagaceae		
grandifolia		
japonica	Arnold Arboretum	1911
sylvatica	Ellwanger & Barry	
s. 'Asplenifolia'	Ellwanger & Barry	1907
s. 'Atropunicea'		
s. 'Latifolia'		
s. 'Pendula'	Ellwanger & Barry	1907
s. 'Rohan'	Brimfield Gard.	1953
s. 'Roseo-marginata'	Ellwanger & Barry	1892
FONTANESIA - Oleacea		
Fortunei	Spaeth Nur.	1892
FORESTIERA - Oleaceae		
acuminata	J. Dawson	1892
neo-mexicana	Rockmont Nur.	1923
FORSYTHIA - Oleaceae		
europea	Arnold Arboretum	1906
intermedia	Transon Nur.	1892
i. X japonica saxatilis 'Arnold Dwarf'	Morton Arboretum	1953
i. 'Mertensiana' (N.)	Holden Arboretum	1960
i. 'Primulina'	Farquhar Nur.	1917
ovata	Arnold Arboretum	1920
o. 'Robusta' (N.)	Morton Arboretum	1962
suspensa	Spaeth Nur.	1892
s. atrocaulis	Arnold Arboretum	1913
s. a. 'Nymans' (N.)	U. S. D. A.	1961
s. 'Decipiens'	Arnold Arboretum	1911
s. Fortunei	Ellwanger & Barry	1892
viridissima	Ellwanger & Barry	
v. 'Bronxensis'	Garden-in-the-Woods	1953
v. koreana	Arnold Arboretum	1922
FOTHERGILLA - Hamamelidaceae		
major	Arnold Arboretum	1902
FRAXINUS - Oleaceae		
americana		
a. 'Ascidiata'	Dr. Schull, Cold Spring Harbor	1915
angustifolia australis		
a. 'Monophylla '	Dickson Nur.	1907
biltmoreana	Biltmore Nur.	1902
Bungeana	Arnold Arboretum	1906
chinensis acuminata	Arnold Arboretum	1920
c. rhynchophylla	Arnold Arboretum	1913
excelsior		
e. 'Diversifolia'	V. McNitt	1954

FRAXINUS, con.		
excelsior 'Pendula'	Arnold Arboretum	1922
holotricha (N.)	Bucharest	1958
longicuspis	Arnold Arboretum	1907
nigra	Arnold Arboretum	1915
Ornus	Spaeth Nur.	1914
pennsylvanica		
p. subintegerrima	Horsey coll., Toledo	1913
platypoda	Arnold Arboretum	1913
pubinervis	Arnold Arboretum	1913
quadrangulata	Kelsey Nur.	1899
sogdiana (N.)	C. G. Crawford	1961
texensis		
tomentosa	Arnold Arboretum	1919
velutina (N.)	N. Y. Bot. Garden	1961
GENISTA - Leguminosae		
tinctoria	A. R. G. S.	1953
t. humilior	Edinburgh	1961
t. 'Plena'	Arnold Arboretum	1958
GINKGO - Ginkoaceae		
biloba	Frost Nur.	1898
b. 'Pendula'	Girard Nur.	1960
GLEDITSIA - Leguminosae		
aquatica	Arnold Arboretum	1902
japonica	Kohankie Nur.	1952
texana	Arnold Arboretum	1921
triacanthos		
t. 'Nana'	Arnold Arboretum	1907
t. 'Skyline'	Cole Nur.	1959
t. 'Sunburst'	Cole Nur.	1955
GLOCHIDION - Euphorbiaceae		
puberum	Arnold Arboretum	1922
GREWIA - Tiliaceae		
biloba parviflora	Arnold Arboretum	1920
GYMNOCLADUS - Leguminosae		
dioicus	W. W. Adams, Union Springs	1919
HALESIA - Styracaceae		
carolina	Meehan Nur.	1890
diptera	Meehan Nur.	1892
monticola	Kelsey Nur.	1890
m. 'Rosea'	Rochester Parks seedling	
m. 'Vestita'	Rochester Parks seedling	
HALIMODENDRON - Leguminosae		
Halodendron	Grootendorst Nur.	1951

HAMAMELIS - Hamamelidaceae		
japonica 'Flavo-purpurascens'	Arnold Arboretum	1922
j. 'Zuccariniana'	Veitch Nur.	1899
mollis	Veitch Nur.	1907
m. 'Superba'	Rochester Parks seedling	
verhalis	B. F. Bush	1908
virginiana		
HEDERA - Araliaceae		
Helix (ex Bulgaria)	Missouri Bot. Gard.	1951
Helix (ex Roumania)	Missouri Bot. Gard.	1951
HELWINGIA - Cornaceae		
japonica	Arnold Arboretum	1902
HEMIPTELEA - Ulmaceae		
Davidii	Arnold Arboretum	1911
HIBISCUS - Malvaceae		
syriacus		
s. 'Coelestis'	Chase Nur.	1949
s. 'Comte de Flandres'		
s. 'De la Reine'		
s. 'Edward Bellamy'	E. G. Teas Nur.	1907
s. 'Hamabo'	Wayside Gard.	1960
s. 'Purpurascens'		
s. 'Ranunculaeflora Plenus'		
s. 'Ruber Plenissimus'		
s. 'Snowdrift'	Meehan Nur.	1915
s. 'W. R. Smith'	Lovetts Nur.	1949
HOLODISCUS - Rosaceae		
discolor	Ellwanger & Barry	1892
HOVENIA - Rhamnaceae		
dulcis	Meehan Nur.	1899
HYDRANGEA - Saxifragaceae		
arborescens	Spaeth Nur.	1892
a. 'Grandiflora'		
Bretschneideri	Spaeth Nur.	1892
B. glabrescens	Arnold Arboretum	1929
cinerea	Parsons Nur.	1892
c. 'Sterilis'	Arnold Arboretum	1915
macrophylla		
paniculata	Arnold Arboretum	1902
p. 'Grandiflora'	Brown Bros. Nur.	1943
p. 'Praecox'	Arnold Arboretum	1914
petiolaris	Parsons Nur.	1892
quercifolia	Ellwanger & Barry	1892
Sargentiana	Lemoine Nur.	1919
serrata 'Rosalba'	Wayside Gard.	1952
xanthoneura Wilsonii	Arnold Arboretum	1910

HYPERICUM - Guttiferae		
Kalmianum	Morton Arboretum	1950
patulum Forrestii	Wisley	1953
ILEX - Aquifoliaceae		
Aquifolium (ex Jugoslavia)	Missouri Bot. Gard.	1951
ciliospinosa	Arnold Arboretum	1958
crenata	Dickson Nur.	1892
c. 'Buxifolia'	Andorra Nur.	1916
c. 'Nummularia'	Holden Arboretum	1960
decidua	Arnold Arboretum	1906
geniculata	Arnold Arboretum	1902
glabra		
g. 'Compacta'	Princeton Nur.	1957
montana	Kelsey Nur.	1892
opaca	Kelsey Nur.	1892
o. 'Clark'	Rutgers Univ.	1951
o. 'Tom Brown'	Rutgers Univ.	1951
pedunculosa	Brimfield Gard.	1955
p. contentinalis	U. S. D. A.	1962
serrata	Arnold Arboretum	1914
Sugeroki	Arnold Arboretum	1955
verticillata	Arnold Arboretum	1902
INDIGOFERA - Leguminosae		
amblyantha	Arnold Arboretum	1916
a. Purdomii	Arnold Arboretum	1917
Gerardiana	Meehan Nur.	1892
incarnata 'Alba'	Arnold Arboretum	1902
Kirilowii	Arnold Arboretum	1907
JAMESIA - Saxifragaceae		
americana	J. Dawson	1892
JUGLANS - Juglandaceae		
cinerea	Arnold Arboretum	1914
major		
mandshurica	Arnold Arboretum	1914
microcarpa	B.H. Slavin coll., Okla.	1917
nigra		
n. 'Laciniata'	Nut Tree Nur.	1953
regia	Arnold Arboretum	1906
r. 'Gligor'	Bernath Nur.	1953
JUNIPERUS - Pinaceae		
chinensis	Ellwanger & Barry	1899
c. 'Blue Cloud' (N.)	National Arboretum	1962
c. 'Iowa' (N.)	D. Hill Nur.	1961
c. 'Mountbatten' (N.)	D. Hill Nur.	1961
communis (N.)		
c. 'Hornibrook' (N.)	U. S. D. A.	1962
c. 'Oblongo-pendula'	Spaeth Nur.	1902
c. 'Stricta'	Brown Bros. Nur.	1943

JUNIPERUS, con.

communis 'Suecica Nana'		
conferta	Arnold Arboretum	
horizontalis 'Alpina'	Ellwanger & Barry	1898
h. 'Plumosa'	Cornell Univ.	1937
macrocarpa (N.)	Secrest Arboretum	1958
media 'Arbuscula'	Bobbink & Atkins	1923
m. 'Globosa'	Ellwanger & Barry	1898
m. 'G. Aureo-globosa' (N.)	Girard Nur.	1962
m. Pfitzeriana		
m. P. 'Compacta' (N.)	Artman Nur.	1955
m. plumosa 'Albo-variegata'	Girard Nur.	1962
rigida	Arnold Arboretum	1896
Sabina	Ellwanger & Barry	1898
S. 'Hicks' (N.)	National Arboretum	1962
S. 'Tamariscifolia'	Ellwanger & Barry	1897
scopulorum		
s. 'Blue Haven' (N.)	D. Hill Nur.	1961
s. 'Pathfinder' (N.)	D. Hill Nur.	1961
Sheppardii	Veitch Nur.	1899
S. 'Pyramidalis'	Brown Bros. Nur.	1943
sphaerica	Ellwanger & Barry	1897
s. 'Keteleer'	Bobbink & Atkins	1927
s. neaboriensis	Princeton Nur.	1927
s. pseudo-mas	Cottage Gard.	
squamata Fargesii	Arnold Arboretum	1914
utahensis (N.)		
virginiana crebra	D. Hill Nur.	1904
v. 'Aurea'	Ellwanger & Barry	1898
v. 'Burk'	Veitch Nur.	1905
v. 'Canaert'	Barbier Nur.	1911
v. 'Cupressifolia' (N.)	D. Hill Nur.	1961
v. 'Elegantissima'	Ellwanger & Barry	1897
v. 'Glauca'	Ellwanger & Barry	1897
v. 'Globosa'	Arnold Arboretum	1923
v. 'Hill'	D. Hill Nur.	1927
v. 'Koster'	Andorra Nur.	1916
v. 'Pendula'	Arnold Arboretum	1921
v. 'Pyramidalis Glauca'	Ellwanger & Barry	1897
v. 'Pyramidalis Viridis'	Ellwanger & Barry	1897
v. 'Schott'	Ellwanger & Barry	1897
v. 'Tripartita'	Arnold Arboretum	1915
v. 'Venusta'	Ellwanger & Barry	1897

KALMIA - Ericaceae

latifolia	Ellwanger & Barry	1892

KALOPANAX - Araliaceae

pictus	Ellwanger & Barry	1892

KERRIA - Rosaceae

japonica	Ellwanger & Barry	1892
j. 'Picta'	Elan Mem. Park	1959

KOELREUTERIA - Sapindaceae		
paniculata		
LABURNUM - Leguminosae		
alpinum	Arnold Arboretum	1907
Watereri	Wayside Gard.	1960
LARIX - Pinaceae		
decidua	D. Hill Nur.	1922
d. 'Flore Alba'		
d. polonica	Arboretum Goluchow	1957
d. 'Pyramidalis'	Ellwanger & Barry	1908
eurolepis	Arnold Arboretum	1914
Gmelinii	Veitch Nur.	1899
G. japonica	Arnold Arboretum	1896
laricina	Mendon Ponds	1896
leptolepis	Veitch Nur.	1899
occidentalis	Arnold Arboretum	1920
sibirica	U. S. D. A.	
LEITNERIA - Leitneriaceae		
floridana		
LESPEDEZA - Leguminosae		
bicolor	Arnold Arboretum	1922
Buergeri		
cyrtobotrya (N.)	Ralph Smith	1961
japonica		
Maximowiczii	Arnold Arboretum	1919
Thunbergii	Meehan Nur.	1919
LEUCOTHOE - Ericaceae		
Fontanesiana	Transon Nur.	1892
F. 'Nana'	Girard Nur.	1958
Grayana	U. of Wash. Arboretum	1958
racemosa	Kelsey Nur.	1892
LEYCESTERIA - Caprifoliaceae		
formosa	Coimbra	1960
LIBOCEDRUS - Pinaceae		
decurrens	Veitch Nur.	1905
LIGUSTRUM - Oleaceae		
acutissimum	Arnold Arboretum	1909
amurense	Transon Nur.	1892
compactum (N.)	Goteburg	1960
Delavayanum (N.)	Coimbra	1959
ibolium	Elm City Nur.	1920
Ibota	Spaeth Nur.	1892
obtusifolium	Arnold Arboretum	1931
o. Regelianum		
ovalifolium	V. Gibbs	1914

LIGUSTRUM, con.		
ovalifolium 'Aureum'	Teas Nur.	1918
Quihouii	Arnold Arboretum	1924
sinense	Parsons Nur.	1892
Tschonoskii	Arnold Arboretum	1907
T. 'Macrocarpum' (N.)	Wageningen	1959
vulgare	Spaeth Nur.	1892
v. 'Auriflorum'	Arnold Arboretum	1915
v. 'Buxifolium'	Ellwanger & Barry	1892
v. 'Insulense'	Arnold Arboretum	1929
v. 'Italicum'	Spaeth Nur.	1892
v. 'Pyramidale'	Ellwanger & Barry	1892
LINDERA - Lauraceae		
Benzoin	Meehan Nur.	1915
LIQUIDAMBAR - Hamamelidaceae		
styraciflua	B.H. Slavin coll., Cabin Johns Br., Potomac R.	1911
LIRIODENDRON - Magnoliaceae		
Tulipifera	Arnold Arboretum	1902
T. 'Fastigiata'	Arnold Arboretum	1919
LONICERA - Caprifoliaceae		
Altmannii pilosiuscula		
amoena	Regel & Kesselring	1910
bella 'Atrorosea'	Spaeth Nur.	1892
b. 'Candida'	Spaeth Nur.	1892
b. 'Rosea'	Spaeth Nur.	1892
Chamissoi (N.)	Leningrad	1960
chrysantha	Spaeth Nur.	1892
c. latifolia	Regel & Kesselring	1910
c. 'Regel'	Arnold Arboretum	1915
coerulea	Ellwanger & Barry	1893
c. glabrescens	Spaeth Nur.	1892
c. 'Viridifolia'		
demissa	Arnold Arboretum	1916
Ferdinandii	N. Y. Bot. Gard.	1951
F. leycesteroides (N.)	Copenhagen	1957
fragrantissima	Ellwanger & Barry	1892
gracilipes (N.)	Morton Arboretum	1962
gynochlamydea (N.)	Bucharest	1958
Henryi	Arnold Arboretum	1912
heterophylla Karelinii	Moscow	1961
hispida glandulifera	Leningrad	1959
iberica	Spaeth Nur.	1892
Korolkowii floribunda		
Maackii	Arnold Arboretum	1907
M. 'Erubescens'	Arnold Arboretum	1920
M. podocarpa	Arnold Arboretum	1913
Maximowiczii	Spaeth Nur.	1892
microphylla	Essen	1960

LONICERA, con.		
minutiflora	Spaeth Nur.	1892
Morrowii	Spaeth Nur.	1892
muendenensis	Lemoine Nur.	1902
muscaviensis	Arnold Arboretum	1915
myrtilloides	Modena	1956
Myrtillus	Uppsala	1951
notha	Spaeth Nur.	1892
Olgae	Moscow	1961
orientalis caucasica	Spaeth Nur.	1892
o. longifolia	Spaeth Nur.	1892
pileata	Lemoine Nur.	1912
pseudochrysantha	Morton Arboretum	1944
quinquelocularis	Arnold Arboretum	1907
Ruprechtiana	Kohankie Nur.	1949
salicifolia	Spaeth Nur.	1892
spinosa Albertii	Kohankie Nur.	1949
Standishii	LeRoy Nur.	1892
syringantha	Arnold Arboretum	1913
tatarica	Spaeth Nur.	1892
t. 'Latifolia'	Ellwanger & Barry	1892
t. 'Parvifolia'	Arnold Arboretum	1907
t. 'Sibirica'	Kohankie Nur.	1949
Tartarinovii (N.)	Morton Arboretum	1962
tenuipes	Morton Arboretum	1926
Webbiana	Arnold Arboretum	1914
xylosteoides	Spaeth Nur.	1892
Xylosteum	Spaeth Nur.	1892
LYCIUM - Solanaceae		
chinense	Spaeth Nur.	1892
halimifolium		
MAACKIA - Leguminosae		
amurensis	Arnold Arboretum	1906
a. Buergeri		
Fauriei	Arnold Arboretum	
tenuifolia	Am. Hort. Society	1960
MACLURA - Moraceae		
pomifera		
MAGNOLIA - Magnoliaceae		
acuminata	Meehan Nur.	1915
Ashei	Willowwood	1954
cordata		
denudata		
Fraseri	Biltmore Nur.	1902
Kobus	N. Y. Bot. Gard.	1923
K. borealis	Arnold Arboretum	1914
K. 'Stellata'	Ellwanger & Barry	1892
K. 'S. Rosea'	Kohankie Nur.	1948
K. 'S. Water Lily'	A. W. Hostek	1951

MAGNOLIA, con.

liliflora 'Nigra'		
macrophylla	Ellwanger & Barry	1905
obovata	Transon Nur.	1892
salicifolia	Van Heiningen	1914
s. 'Fasciata'		
Sieboldii	Arnold Arboretum	1919
Soulangeana		
S. 'Alba'		
S. 'Alexandrina'		
S. 'Amabilis'		
S. 'Andre Leroy'		
S. 'Brozzon'		
S. 'Lenne'		
S. 'Niemetz'	N. Y. Bot. Gard.	1951
S. 'Norbertiana'	Kallen & Lunneman	1914
S. 'Rubra'		
S. 'Speciosa'		
S. 'Verbanica'		
tripetala		
virginiana	Kelsey Nur.	1899

MAHOBERBERIS - Berberidaceae

Aquisargentii (N.)	Holden Arboretum	1960
Neubertii	ex Rochester garden	1955

MAHONIA - Berberidaceae

Aquifolium	Ellwanger & Barry	1893
A. 'Vicary'	V. Gibbs	1914
Bealii	Brimfield Gardens	1953
repens	Backhouse Nur.	1892
r. 'Subcordata'	Dickson Nur.	1892
Wagnerii	Veitch Nur.	1892

MALUS - Rosaceae

adstringens 'Hopa'	N. J. Exp. Station	1931
a. 'Montreal Beauty'	Ellwanger & Barry	1909
a. 'Olga'	Arnold Arboretum	1919
'Almey'		
angustifolia	Biltmore Nur.	1919
arnoldiana	Arnold Arboretum	1909
atrosanguinea		
baccata		
b. 'Costata'	Spaeth Nur.	1902
b. 'Flava'		
b. gracilis	Arnold Arboretum	1910
b. Jackii	Arnold Arboretum	1918
b. mandshurica	Arnold Arboretum	1912
brevipes	Keller Nur.	1951
'Cathay'		
coronaria	Dunbar & Horsey, Buffalo	1906
c. 'Charlotte'	Princeton Nur.	1954
c. dasycalyx	Horsey coll., Toledo	

MALUS, con.

coronaria elongata	Horsey, Oberlin	
c. lancifolia	Horsey, Mansfield	1915
c. 'Nieuwland'	B. H. Slavin sel.	
Dawsoniana	Arnold Arboretum	1906
'Dolgo'	Arnold Arboretum	1922
'Flame'	Weston Nur.	1960
floribunda	Chase-Pitkin Nur.	1943
f. 'Ellwanger'	Ellwanger & Barry	
fusca	Arnold Arboretum	1892
glaucescens	Seedlings of type tree in Maplewood Park	
gloriosa 'Oekonomierat Echtermeyer'	Keller Nur.	1951
Halliana 'Parkman'		
heterophylla 'Mathews'	N. Y. Bot. Gard.	
hupehensis	Arnold Arboretum	1911
ioensis	Arnold Arboretum	1909
i. 'Fimbriata'	B.H. Slavin sel.	
i. 'Klehm'	Cole Nur.	1958
i. Palmeri	Arnold Arboretum	1915
'Katherine'	Rochester Parks seedling	
'Marshall Oyama'	Keller Nur.	1951
'Mary Potter' (N.)	Weston Nur.	1962
micromalus	Ellwanger & Barry	1899
orthocarpa	Spaeth Nur.	1902
Pallasiana (N.)	Leningrad	1959
'Pixie' (N.)	Morton Arboretum	1962
platycarpa	Arnold Arboretum	1913
'Prince Georges'	Keller Nur.	1951
prunifolia	Spaeth Nur.	1902
p. Rinkii	Arnold Arboretum	1916
pumila		
p. 'Niedzwetsky'	Ellwanger & Barry	1898
p. 'Elise Rathke'	Arnold Arboretum	1915
purpurea	Spaeth Nur.	1905
p. 'Eley'	ex Crittenden Blvd.	1950
'Red Jade'	Brooklyn Bot. Gard.	1953
'Red Tip'	Arnold Arboretum	1919
robusta		
r. 'Dulcis'	Spaeth Nur.	1902
r. 'Joan'	Rochester Parks seedling	
r. persicifolia	Arnold Arboretum	1920
'Rondo'	Boerner Bot. Gard.	1960
Sargentii	Arnold Arboretum	1909
S. 'Rosea'	B. H. Slavin sel.	1919
Sieboldii	Arnold Arboretum	1902
S. arborescens	Arnold Arboretum	1918
sikkimensis	Arnold Arboretum	1911
Soulardii		
spectabilis	Arnold Arboretum	1909
s. 'Plena'		
s. 'Rivers'		

MALUS, con.		
sublobata 'Cashmere'		
sylvestris	Arboretum Goluchow	1957
transitoria		
yunnanensis	Arnold Arboretum	1918
Zumi	Arnold Arboretum	1909
Z. 'Bobwhite'	Arnold Arboretum	1917
Z. 'Calocarpa'	Arnold Arboretum	1918
Z. 'C. Golden Hornet'	Notcutt Nur.	1960
MARSDENIA - Asclepiadaceae		
erecta	Arnold Arboretum	1907
METASEQUOIA - Pinaceae		
glyptostroboides	C. Y. Chiao, Nanking	1948
MORUS - Moraceae		
albus		
a. tatarica		
australis	Arnold Arboretum	1914
MYRICA - Myricaceae		
cerifera	Arnold Arboretum	1902
pensylvanica	Meehan Nur.	1919
NEILLIA - Rosaceae		
longiracemosa	Arnold Arboretum	1902
sinensis	Arnold Arboretum	1902
thibetica (N.)	U. of Wash. Arboretum	1961
NEVIUSIA - Rosaceae		
alabamensis	Meehan Nur.	1899
NYSSA - Nyssaceae		
Ogeche	C. C. Laney coll., Fla.	1916
sylvatica	Arnold Arboretum	1913
ORIXA - Rutaceae		
japonica	Arnold Arboretum	1902
OSTRYA - Betulaceae		
japonica	Arnold Arboretum	1902
virginiana	Spaeth Nur.	1914
OXYDENDRUM - Ericaceae		
arboreum	Parsons Nur.	1892
PACHISTIMA - Celastraceae		
Canbyi	Arnold Arboretum	1906
PACHYSANDRA - Buxaceae		
procumbens	Holden Arboretum	1956
terminalis	J. Dawson	1892

PAEONIA - Ranunculaceae		
Delavayi		
suffruticosa 'Banks'		1905
PARROTIA - Hamamelidaceae		
persica	Veitch Nur.	1892
PARROTIOPSIS - Hamamelidaceae		
Jacquemontiana	Freiburg	1952
PARTHENOCISSUS - Vitaceae		
tricuspidata		
t. 'Lows'	Horton Nur.	1958
PAULOWNIA - Scrophulariaceae		
tomentosa	Arnold Arboretum	1913
PETTERIA - Leguminosae		
ramentacea	Arnold Arboretum	1916
PHELLODENDRON - Rutaceae		
amurense	Arnold Arboretum	1912
chinense	Arnold Arboretum	1915
piriforme	Arnold Arboretum	1929
sachalinensis	T. E. Proctor, Topsfield	1904
PHILADELPHUS - Saxifragaceae		
'Belle Etoile'	Wayside Gard.	1949
'Bicolore'	Lemoine Nur.	1919
brachybotrys	Lemoine Nur.	1914
caucasicus (N.)	Bautumi	1961
c. 'Aureus'	Brown Bros. Nur.	1943
coronarius	Leroy Nur.	1892
c. 'Deutziaeflorus'		
c. 'Duplex'	Ellwanger & Barry	1892
c. 'Primulaeflorus'	Spaeth Nur.	1892
c. 'Zeyher'	Dickson Nur.	1892
cymosus 'Banniere'		
c. 'Ophelie'	Lemoine Nur.	1914
c. 'Rosace'	Lemoine Nur.	1905
c. 'Voie Lactee'	Lemoine Nur.	1908
dasycalyx	Arnold Arboretum	1920
Delavayi (N.)	Oslo	1957
Falconeri		
hirsutus		
incanus	Arnold Arboretum	1909
inodorus	Spaeth Nur.	1892
i. grandiflorus	Spaeth Nur.	1892
i. laxus	Ellwanger & Barry	1892
insignis	Arnold Arboretum	1915
kansuensis	Arnold Arboretum	1929
Lemoinei	Transon Nur.	1892

PHILADELPHUS, con.

Lemoinei 'Avalanche'	Lemoine Nur.	1902
L. 'Erectus'	Lemoine Nur.	1902
L. 'Innocence'	Wayside Gard.	1949
Lewisii	Spaeth Nur.	1892
L. Gordonianus	Spaeth Nur.	1892
L. Helleri	Ellwanger & Barry	1906
maximus	U. S. D. A.	1949
'Mt. Shasta' (N.)	Morton Arboretum	1962
nivalis	Ellwanger & Barry	1906
pekinensis	Ellwanger & Barry	1906
pendulifolius	Spaeth Nur.	1892
polyanthus 'Atlas'		1944
p. 'Favorite'	Lemoine Nur.	1917
p. 'Gerbe de Neige'	Lemoine Nur.	1902
p. 'Mont Blanc'	Lemoine Nur.	1902
p. 'Norma'	Lemoine Nur.	1912
p. 'Pavillon Blanc'	Lemoine Nur.	1902
pubescens	Spaeth Nur.	1892
purpurascens	Arnold Arboretum	1911
purpureo-maculatus 'Sylviane'	Lemoine Nur.	1919
salicifolius	Spaeth Nur.	1892
satsumanus	Farquhar Nur.	1917
satsumi	Farquhar Nur.	1917
Schrenkii	Arnold Arboretum	1919
sericanthus	Lemoine Nur.	1910
s. kulingensis	Arnold Arboretum	1912
'Silver Rain' (N.)	U. S. D. A.	1962
subcanus	Lemoine Nur.	1914
s. Magdalenae	Arnold Arboretum	1912
tenuifolius	Spaeth Nur.	1892
tomentosus	Spaeth Nur.	1892
virginalis	Lemoine Nur.	1910
v. 'Albatre'	Lemoine Nur.	1914
v. 'Argentine'	Lemoine Nur.	1914
v. 'Enchantment'	Wayside Gard.	1949
v. 'Fleur de Neige'	Lemoine Nur.	1916
v. 'Girandole'		
v. 'Glacier'	Lemoine Nur.	1914
v. 'Minnesota Snowflake'	Morton Arboretum	1950
v. 'Pyramidal'	Lemoine Nur.	1917
v. 'Slavin'	BHS #57, seedling of Glacier	

PHOTINIA - Rosaceae

Beauvardiana notabilis (N.)	N. Y. Bot. Gard.	1954
villosa	V. Gibbs	1914
v. laevis		
v. Maximowicziana (N.)	Morton Arboretum	1959
v. sinica	Arnold Arboretum	1915

PHYSOCARPUS - Rosaceae

amurensis (N.)	O. E. White Arboretum	1961
bracteatus	Andrews Nur.	1914

PHYSOCARPUS, con.		
glabratus	Andrews Nur.	1914
intermedius parvifolius	Arnold Arboretum	1921
opulifolius	J. Dawson	1892
o. 'Luteus'	Brown Bros. Nur.	1943
PICEA - Pinaceae		
Abies	Ellwanger & Barry	1902
A. 'Aurescens'	Westbrook Gard.	1923
A. 'Clanbrasiliana' (N.)	Mayfair Nur.	1958
A. 'Cupressina'	Arnold Arboretum	1922
A. 'Ellwanger'	Arnold Arboretum	1905
A. 'Highlandia'		
A. 'Inversa'	Parsons Nur.	1905
A. 'Maxwell'	Parsons Nur.	1905
A. 'Microsperma'	Barbier Nur.	1911
A. 'Nana'	Barbier Nur.	1911
A. 'Nidiformis' (N.)	Mayfair Nur.	1958
A. 'Parsons'	Parsons Nur.	1905
A. 'Parviformis'	Barbier Nur.	1911
A. 'Pendula'	Andorra Nur.	1907
A. 'Procumbens' (N.)	Mayfair Nur.	1958
A. 'Pumila'	Arnold Arboretum	1906
A. 'Veitch'	Veitch Nur.	1905
A. 'Viminalis'		
asperata	Arnold Arboretum	1908
a. heterolepis	Arnold Arboretum	1915
a. ponderosa	Arnold Arboretum	1917
aurantiaca	Arnold Arboretum	
bicolor	Arnold Arboretum	1906
Breweriana		
Engelmannii	Biltmore Nur.	1895
E. 'Glauca'		
glauca	Ellwanger & Barry	1896
g. albertiana	Jack coll., Kalispell	1921
g. 'Coerulea'		
g. conica		
Glehnii	Arnold Arboretum	1900
jezoensis	Veitch Nur.	1899
j. hondoensis		
Koyamai		
likiangensis (N.)		
mariana 'Doumet'	Manda Nur.	1905
Maximowiczii	Barbier Nur.	1902
obovata	Veitch Nur.	1899
Omorika	Arnold Arboretum	1896
orientalis	Ellwanger & Barry	1899
o. 'Aurea' (N.)		
polita	Little Nur.	1897
pungens	Arnold Arboretum	1896
p. 'Argentea'		
p. 'Glauca'		
p. 'Pendens'		

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XV

Harold N. Moldenke

VERBENA LASIOSTACHYS Link

The type of V. leptostachya was collected by Ynes Wilton Winblad in San Luis Obispo County, California, on June 17, 1937, and is deposited in the herbarium of the California Academy of Sciences at San Francisco, while that of V. lamberti Spreng. is Lejeune s.n., collected from cultivated material in Belgium and deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. The V. lamberti Ker, referred to in the synonymy of the species here under discussion, is actually V. elegans H.B.K., while the V. lamberti of Penny and of Sims is V. canadensis (L.) Britton; the V. prostrata of Bentham is V. lasiostachys var. septentrionalis Moldenke, while that of G. Savi is V. bracteata Lag. & Rodr. Verbena lasiostachys var. abramsi (Moldenke) Jepson is herein regarded as V. abramsi Moldenke, which see.

Verbena lasiostachys has been employed by cytologists in successful hybridization experiments and it is most probable that some of the perplexing specimens seen in herbaria and in the wild represent natural hybrids with related taxa. Hybrids definitely known thus far are with V. halei Small (=xV. scorta Moldenke), with V. hispida Ruíz & Pav. (=xV. lecocqi Moldenke), and with V. urticifolia L. (=xV. inhonesta Moldenke). It almost certainly hybridizes with V. robusta Greene and with V. abramsi in the wild where its range overlaps that of those species. Mattoon (1958) states that V. lasiostachys is offered to the horticultural trade by Clyde Robin.

Walpers (1845) places V. prostrata R. Br. in the synonymy of V. aubletia L. with a question. Jepson (1943) reduces var. scabrida Moldenke and var. septentrionalis Moldenke to the typical form of V. lasiostachys and cites many specimens. Admittedly these varieties are not always as distinct as one would desire, but in my opinion they are definite enough to warrant nomenclatural designation. One, in fact, was actually regarded as a separate species by Kearney (V. nevadensis Kearney). They are probably in the process of becoming stabilized.

Herbarium material of V. leptostachya has been misidentified and distributed rather widely under such names as V. ciliata Benth., V. hastata L., V. menthaefolia Benth., V. officinalis L., V. officunalis L., V. polystachya H.B.K., "V. prostrata var.", V. robusta Greene, and V. urticifolia L.

On the other hand, the Bradshaw 68, Hoover 3812, J. McDonald s.n. [Big Sandy Creek, June 1915], C. V. Meyer 240, S. B. Parish 11590, L. W. Reinecke s.n. [September 5, 1937], Rutter 17, L. C.

Wheeler 3315, and Mrs. W. J. Williamson 189, all distributed as V. lasiostachys or V. prostrata, are actually V. lasiostachys var. scabrida Moldenke; Akey 50, Alderson 8464, s.n. [Witch Creek, 1893], & s.n. [Witch Creek, June 1921], Mrs. R. M. Austin s.n., M. S. Baker 14 & s.n. [Morley's Station, May 22], W. H. Baker 4207, J. H. Barber 35 & s.n. [Paso Robles, April 23, 1899], Belshaw 2204, Braunton 100 & 378, W. H. Brewer 31, G. D. Butler 1621, H. P. Chandler 1353, Chesnut & Drew s.n. [Hy-Am-Pum, July 21, 1888], L. Constance 448, W. B. Cooke 15149, Mrs. E. Cooper s.n. [Sta. Barbara, June 1879], Coville & Funston 1110, Davy & Blasdale 5892, G. W. Dunn 566, Eastwood 166, Eggleston 9724, Elmer 3846, Evermann s.n. [Santa Paula, 1881], Ewan 8401, Gifford 197, H. M. Hall 1475, Hansen 1823, A. A. Heller 5785 & 5919, T. M. Hendrix 269 & 1043, Herb. Calif. Polytech. School s.n. [Poly Canon, May 14, 1905], Holman s.n. [Santa Barbara Forest, May 24, 1933], J. T. Howell 174 & s.n. [Grant's Pass, July 3d, 1887], Johannsen 46, A. Kellogg s.n. [near San Francisco, 1866], H. C. Lee 972, C. C. Marshall s.n. [1888], McMurphy 320, Michener & Bioletti s.n. [Oakland, 1891], Morrow, Cook, & Cook 64, R. E. Nelson 159, Nobs & Smith 472, Edw. Palmer 342, W. A. Peterson 307, Pupils of L. A. High School s.n. [May 1902], Rothrock s.n. [Santa Barbara, June 1875], Schulthess s.n. [Kelseyville, July 3, 1931], H. K. Sharsmith 1139 & 3187, Simontacchi 74, C. V. Smith s.n. [Berkeley, June 4, 1906], Stahelin s.n. [U. S. Dept. Agr. Forest Serv. 19562], Mrs. R. W. Summers s.n. [June 13, 1887], J. P. Tracy 2775, 5059, 12632, & 12965, G. R. Vasey s.n. [California, 1875], H. A. Walker 211, and H. S. Yates 3577 are V. lasiostachys var. septentrionalis Moldenke; Abrams & McGregor 689, E. B. Babcock s.n. [near Pomona, Aug. 24, 1902], Brock 297, J. B. Davy 2859, Kearney 56, M. A. King s.n. [Menifee, 1893], H. L. Mason 8149, Edw. Palmer 309, S. B. Parish s.n. [July 1887] & s.n. [Aug. 1889], Parish & Parish 969, Simontacchi 628, and G. R. Vasey s.n. [San Antonio River, 1880] are V. abramsi Moldenke; Suksdorf s.n. [July 22, 1881] is V. bracteata Lag. & Rodr.; D. R. Harvey 539 is V. neomexicana var. xylopoda Perry; Hansen 477 is V. officinalis L.; and T. S. Brandegee s.n. [1881], Chesnut s.n. [Oakland], Clokey 5041, J. B. Davy 278, 289, & 865, Elmer 4950, Epling, Darsie, Knox, & Robison s.n. [Flinn Springs, June 19, 1932], F. R. Fosberg S.4741, S. 4843, & S.5412, Michener & Bioletti 1886 & s.n. [Leona, Aug. 6, 1892], Morton 8698, C. R. Orcutt 1301, L. W. Reinecke s.n. [Redwood City, June 13, 1937], Schreiber 307, H. A. Walker 696, Wiggins & Demaree 4741, and Wiggins & Gillespie 3977 are V. robusta Greene.

Pellett (1923) states that V. lasiostachys yields considerable honey in some parts of California. Reichenbach (1827) describes the plant as follows: "Eine neue Verbena aus Californien, einjährig, niederliegend, mit kleinen blauen Blütchen, als Zierpflanze nicht zu empfehlen." Nevertheless, it has been cultivated in Germany as early as 1812, in Spain in 1837, in France in 1843, and Junell (1934) records it as cultivated in England (Kew) and Sweden (Uppsala). Bailey (1935) says that Kew handles the seeds. Common names recorded for it are "California vervain", "common vervain", "prostrate vervain", "tibinagua", and "woolly-spiked vervain". It is mentioned by Sharsmith (1945) as occurring in the Mount Hamilton Range, California.

Eastwood (1941) included *V. lasiostachys* as reported from the Channel Islands under the name of *V. prostrata* in her concept of *V. robusta* Greene. She therefore excludes *V. lasiostachys* from the flora of San Clemente Island (as reported by Munz in 1935), and in this disposition she was followed by Gentry and by me as late as 1959. The San Clemente specimens, however, are plainly *V. lasiostachys* and not *V. robusta*!

Verbena lasiostachys is often infested by the fungus, *Pleospora herbarum* (Fries) Rabh. Felt (1912, 1917) describes a gall in the form of a cylindric swelling of the flower-stalk caused by the Itonid gall-midge, *Lasioptera verbenae* Felt, based on a specimen collected by P. H. Timberlake in the Puente Hills at Whittier, California, on November 13, 1910. The larvae hibernate in silken tubes attached to the walls of the gall.

Schauer (1847) cites a Douglas collection in the DeCandolle Herbarium at Geneva from California. He affirms that he has seen cultivated material of the species and that it is related to *V. stricta* Vent. "sed jam crescendi modo et habitu longe diversa." Perry (1933) cites the following 22 additional specimens not yet seen by me: OREGON: Curry Co.: *J. C. Nelson 1429* (G). Jackson Co.: *M. E. Peck 8702* (E, G). Josephine Co.: *J. T. Howell 1249* (E). CALIFORNIA: Lake Co.: *Blankinship s.n.* [Clear Lake, 12 July 1929] (E); *A. A. Heller 5919* (E, G); *J. Torrey 417* (G). Los Angeles Co.: *Fritchey 29* (E). Mendocino Co.: *Chestnut s.n.* [20 May-20 June 1898] (W). Monterey Co.: *Elmer 4045* (G); *Hartweg 1924* (G); *A. A. Heller 6778* (E, F, G). San Diego Co.: *M. E. Spencer 994* (G), *1164* (G). San Luis Obispo Co.: *Mrs. R. W. Summers s.n.* [19 June 1887] (E). Santa Clara Co.: *Pammel 187* (E). Santa Cruz Co.: *M. E. Jones s.n.* [Santa Cruz, 21 June 1881] (G, Po). Ventura Co.: *Abrams & McGregor 5* (G). She says: "Although, from the original publication, one would naturally infer that *V. prostrata* is Aiton's species, it is in all probability Robert Brown's. Aiton, in his acknowledgements (postscript to the fifth volume of Hortus Kewensis), mentions the new matter added by his friend Robert Brown, some without reference to his name; more tangible evidence is furnished by Schauer, who, in his monograph, indicates the specimen at Kew as *V. prostrata* R. Br.

"The species is comparatively easy to distinguish by its decumbent habit, soft villous pubescence, and elongated spikes. It closely resembles V. robusta, which is much harsher and of limited distribution." The Culbertson 4210, Edw. Palmer 309, S. B. Parish 2819, Parish & Parish 969, and Parry & Lemmon 342 which she cites as being different from V. lasiostachys, but to which she does not assign a name, are V. abramsi Moldenke, as is also the Vasey s.n. [San Antonio River, 1880]. The Parish 11590 which she cites is regarded by me as being V. lasiostachys var. scabrida, while Palmer 342 and Torrey 416 are V. robusta, and Clemens s.n. [Wood's Creek, Fresno Co., 19 June 1910], Braunton 378, Brewer 31, Elmer 3846, Hansen 964 & 1823, Heller 5785, J. C. Nelson 2669, Piper 6160, J. W. Thompson 4412, C. Epling 5445, J. T. Howell 174 & s.n. [Grant's Pass, July 30th, 1887], and Hammond 322 are V. lasiostachys var. septentrionalis. The Butler 1621 is in part var. scabrida and in part var. septentrionalis, while Wilkes 1661 is in part V. abramsi and in part V. lasiostachys var. septentrionalis. Prof. P. H. Raven, in a letter to me dated November 14, 1962, states that there is a sheet of Munz 6734 in the Pomona herbarium.

The following collections need to be re-examined. Although cited by me herein as V. lasiostachys, at least in part, it is most probable that they are not properly so to be regarded: Butler 1621 [probably var. scabrida or var. septentrionalis], Heller 5919 [perhaps var. septentrionalis], J. T. Howell 11548 [probably var. scabrida], L. C. Wheeler 666 [probably var. septentrionalis] and 3315 [probably var. scabrida], and Wiggins 8957 [probably var. scabrida or var. septentrionalis]. The Nobs & Smith 868 collection, although regarded by me as var. septentrionalis in the California Academy of Sciences herbarium, is definitely typical V. lasiostachys in the University of California herbarium!

In all, 283 herbarium specimens of what I have regarded as the typical form of this species have been examined by me.

Citations: NOOTKA ISLAND: Née 111 (Q). NEW YORK: Kings Co.: Ruger s.n. [Brooklyn, Sept. 16, 1873] (C). OREGON: Douglas Co.: M. E. Jones s.n. [Glendale, June 19, 1902] (Po—70666). Jackson Co.: Applegate 2228 (W—1432734); Cusick 4812 (Pl—121411); E. C. Johnston s.n. [Trail Creek, July 31, 1931] (Gg—192085); M. E. Peck 8702 (Ba, N). Josephine Co.: L. F. Henderson s.n. [Dickson & Drake s.n.] (N). County undetermined: Abrams & McGregor 689 (N); M. E. Jones 29064 [North fork of Noyo River] (Po—188458). CALIFORNIA: Alameda Co.: MacNeil s.n. [King's Run, May 9, '96] (Gg—31351). Calaveras Co.: Bigelow s.n. [Mokelumne Hill] (T); Blaisdell s.n. [Mokelumne Hill] (Gg—31335). Lake Co.: A. A. Heller 5919 (N, Po—54561, Ur); Mrs. L. R. Reynolds s.n. [foot of Mt. Sanhedrin, June 1907] (Gg—31354). Los Angeles Co.: Balls 10065 (S); Bright 8495 (W—1432734); M. L. Bryant 88 (Po—155763); Cohen 502 (Po—267644); Crawford & Hiatt s.n. [Santa Monica Mts., 2/28/16]

(Po—4008); Elmer 3846 (N); Ewan 7540 (En); F. R. Fosberg S.3042 (N); G. B. Grant 1365 (Du—756531), 2575 (Du—75585); H. E. Hasse s.n. [Los Angeles, September 1887] (N, Pa, W—71922); D. Haynes s.n. [Pasadena, June 1893] (Po—4015); Hilend s.n. [Topanga Canyon, May 19, 1933] (Bt—20500); I. M. Johnston 1320 (Du—109078, Mi, Po—4011, W—1103173); MacFadden 92e (Ca—450803, Ob—50822); McClatchie s.n. [Pasadena, 9/11/1892] (N); Steele & Pratt s.n. [May 4, '33] (Ob—69478); ?L. C. Wheeler 666 (Po—214392, Rs—9719). Mariposa Co.: L. J. Fox s.n. [Yosemite Valley] (I). Mendocino Co.: Chesnut 1 (W—430451); Rattan s.n. [June 1882] (Du—19182); L. S. Rose 39140 (Ca—882662, Ew, Ky, N, W—1897881, We). Monterey Co.: Abrams 5627 (Du—65604); Chisaki, Sharsmith, & Solbrig 2823 (Ca—177949, W—2301140); H. Davis 112 (Po—126526); W. R. Dudley s.n. [June 24, 1905] (Du—17455); H. P. Chandler 404 (Ca—25156); Elmer 4045 (Ca—184382, Du—142144, Po—128528); C. A. Graham 199 [U. S. Dept. Agr. Forest Serv. 22416] (Ca—124413); Hartweg 1924 (N); A. A. Heller 6778 (Ca—58422, Du—24203, Du—75576, Du—75587, N, Po—64519, W—467197); J. T. Howell 11562 (Gg—212574, Po—204175), 11575 (Gg—212573, Mn—20852), 11578 (Gg—212582, S, Um—18), 11580 (Gg—212358), 39561 (Z), 39595a (B), 40095 (B); Knoche 234 (Du); Mallory s.n. [May 4, 1920] (Du—110895); Michener & Bioletti s.n. [Moss Beach, July 1891] (Se—95720); Ottley 1276 (Ws); Parry s.n. [Monterey, 1850] (N); R. A. Plaskett 142 (N, W—341448); L. S. Rose 33338 (Vt), 53042 (B, Go, Go); L. C. Wheeler 4294 (Ca—604725); Willey s.n. [Monterey, 1849—1850] (Dt); Youngberg 228 (Ca—597704, Po—231142), s.n. [July 1938] (Po—258837, Ua—39522). Orange Co.: Booth 1171 (Ca, Po—201796); W. H. Brewer 717 (W—322401); E. H. Campbell 91 (Gg—31338); D. L. Crawford s.n. [near Laguna, July 1916] (Po—4010); F. R. Fosberg S.935 (Up); Munz 6734 (Po—18203); Munz, Street, & Williams 2686 (Du—107318, Po—6327). Riverside Co.: J. T. Howell 1040 (Rs—652). San Benito Co.: W. H. Brewer 717 (Ca—25160); ?J. T. Howell 11548 (La); Pieters s.n. [June 1, 1910] (Mi). San Bernardino Co.: I. M. Johnston 1407 (Ca—205358), 1608 (Ca—205359, Ca—212188, Du—83815, Po—4012); Lhan & Illingworth 30 (Du—143859); Munz 12313 (N); S. B. Parish 4606 (Du—91159), 9479 (Vi), s.n. [Sept. 1900] (Du—143858); E. L. Peterson 831 (En); F. M. Reed 7990 (Bt—15802). San Diego Co.: Alderson s.n. [June '94] (Mi); H. P. Chandler 5378 (N); F. R. Fosberg S.911 (Up), S.926 (Up); Gander 167.24 (Sd—11037), 2075 (Sd—15496), 2161 (Sd—15583), 6142 (Sd—21938), 6195 (Sd—22058), 8447 (Sd—27110); Herb. Cleveland s.n. [San Diego, June 1875] (Sd—6792), s.n. [Mussel Beds, May 13, 1885] (Sd—6790); E. R. Johnson 1308 (Rs—1487); E. B. Kurtz s.n. [August 1937] (Up);

Mills s.n. (Ur--22835); Orcutt s.n. [Cuyamaca Mts., Sept. 1882] (Sd--6779, Sd--6787), s.n. [1890] (Mi); Edw. Palmer 184 (Sd--6780); Snyder s.n. [La Jolla, May 1897] (Sd--4252); M. E. Spencer 994 (N, Ob--50842, Po--47698), s.n. [10/10/1918] (Ob--50825); Stokes s.n. [Smith Mt., Aug. 1898] (Sd--13470); Stover s.n. [Point Loma, May 4, 1938] (Sd--21028); L. F. Street s.n. [May 12, '17] (Du--107329); Wiggins 2614 (Au--194526, Ca--1612, Ca--1654, Du--366023), 2967 (Ca--1655, Ca--429803, Ca--473771, Du--182564, Du--366045); Wood & Negley s.n. [Palomar Mt., Sept. 20, 1936] (Sd--16405). San Luis Obispo Co.: L. D. Benson 7998 (Po--267639); O. Degener 4685 (Ms, N); F. H. Elmore 349 (Ak--10958); R. S. Ferris 9770a (Du--269819); Ferris & Rossbach 9434 (Ca--604940, Du--256484); F. R. Fosberg S. 4981 (N); Gander 7534 (Sd--25195); J. McDonald s.n. [July 19, 1925] (Gg--129483); Nobs & Smith 826 (Ca--191997, N), 868, in part (Ca--191998); Nordstrom 1132 [U. S. Dept. Agr. Forest Serv. 19848] (Ca--124407); Steele & Pratt s.n. [June 2, 1933] (Ob--50823); Mrs. R. W. Summers s.n. [June 19, 1887] (Po--64653); Winblad s.n. [June 17, 1937] (Gg--253028). San Mateo Co.: Blasdale s.n. [Pilarcitos, June 23, 1893] (Ca--450179); W. R. Dudley s.n. [June 18, 1905] (Du--278634); L. S. Rose 32321 (Al, Ms, Se--41594); Walther s.n. [Woodside, June 9, 1919] (Gg--31346), s.n. [Woodside, May 5, 1920] (Gg--31362); Wiggins 3782 (I, La); C. B. Wolf 607 (I, Rs--18513). Santa Barbara Co.: R. S. Beal Jr. s.n. [Santa Barbara, 13 May 1948] (Ca--942561); Bingham 155 (Ka); Demaree 18103 (Du--297049, Io--152354, Ok); Eastwood 401 (Gg--31358), 818 (Gg--31364), s.n. [Santa Barbara, July 29, 1917] (Gg--31340); J. L. Fox s.n. [June and July 1930] (I); Kincaid s.n. [Santa Barbara, July 5, 1935] (Se--34654, Se--34655); Munz 9295 (Po--98527); G. Newell s.n. [San Isidro, Aug. 1913] (Gg--31356); S. B. Parish 11061 (Du--81183); Suksdorf 179 (Pl--138406), 179b (Pl--138405). Santa Clara Co.: Abrams s.n. [Stanford University, April 1898] (Po--87969); W. A. Atkinson s.n. [April 1900] (Du--24216); H. A. Barker 608 (Rs--10374); Collector undesignated 196 (Po--126476); H. A. Davis s.n. [near Lagunita] (Se--46752); Demaree 9205 (Io--147325); W. R. Dudley s.n. [June 1899] (Du--278632), s.n. [June 3, 1900] (Du--278631); H. T. Edwards s.n. [June '77] (N); Hewatt 162 (Au, Nt); Ingels s.n. [Lathrop Hills, Apr. 17, 1908] (Dp); J. D. Randall 422 (Du--63390, Du--63391); W. H. Rich s.n. [June 8, 1912] (Du--98022); R. J. Smith s.n. [July 1906] (Du--77584); H. S. Yates 5528 [U. S. Dept. Agr. Forest Serv. 14953] (Ca--124416). Santa Cruz Co.: Akey 154 [U. S. Dept. Agr. Forest Serv. 11685] (Ca--124404); N. K. Carlson 44 [U. S. Dept. Agr. Forest Serv. 11692] (Ca--124403); H. Davis s.n. [Glenwood, Sept. 1907] (Du--278635); O. Degener 4482 (Ms, N); M. Epling 8310 (La, Or--20188, Or--

20235); M. E. Jones 2215 (Bm, Br, Go, Po--71013); H. L. Mason 3365a (Ca--635116); Pringle s.n. [Aptos, 11 July 1882] (Vt); M. Randall s.n. [5.VII.30] (Ca--495557); E. E. Stanford 488 (Or--20802). Shasta Co.: Nutting s.n. [May 22] (Po--126475). Siskiyou Co.: Edw. Palmer 2529a (W--277855); ?L. C. Wheeler 3315 (St--9255). Sonoma Co.: H. Edwards s.n. [May 1877] (Lu). Tulare Co.: Culbertson 4210, in part (Po--63887); Steele & Pratt s.n. [July 20, 1933] (Ob--70165). Ventura Co.: Abrams & McGregor 5 (Du--24204, N, W--612946); W. H. Brewer 229 (W--322400); Dudley & Lamb 4808 (Ca--463187, Du--9558); Farr s.n. [Ventura, April 9, 1911] (Up--52603); J. P. Harrington s.n. [April 1955] (W--2176802); M. E. Jones s.n. [April 27, 1926] (Po); Kendall s.n. [Ventura, 4-13-23] (Po--17416); Larson 101 (La); Munz 13151 (Po--213656); Ogden s.n. [Ventura, July & Aug. 1892] (Cm); S. F. Peckham s.n. [Ojai, May 15, 1866] (W--344347); H. M. Pollard s.n. [Oak View, Oct. 8, 1944] (Gg--330306); Purer 6703 (Du--271812), 6755 (Bt--29702); Thacher 40 (Ca); Wood & Jones s.n. (La). County undetermined: A. Fitch s.n. (T); Herb. State Survey 717 (Ca--25161); Jepson 21226 [between Sims & Sisson] (Ca). CHANNEL ISLANDS: San Clemente: Munz 6734 (Ca--28475); Murbarger 218 (Ca--557827); Trask 7 (W--444682). MEXICO: Baja California: Fish s.n. [Orcutt s.n., 4-16-1885] (Mn--11968). CULTIVATED: Belgium: Lejeune s.n. (Br); M. Martens s.n. [cult. h. Leod.] (Br). France: Collector undesignated s.n. (Sg--16091); W. H. Harvey s.n. [h. R. P., julio 1843] (Du--166446). Germany: Herb. Martius s.n. [hort. Monac., Aug. 1833] (Br). Maryland: McCann s.n. [9-15-36] (Md). Spain: Herb. Hort. Matrit. 45 (Q). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 1558 (Sg--16114); Herb. Vahl s.n. (S).

VERBENA LASIOSTACHYS f. ALBIFLORA Moldenke, Phytologia 2: 329, nom. nud. (1947), f. nov.

Haec forma a forma typica speciei corollis albis recedit.

Bibliography: Moldenke, Phytologia 2: 329. 1947; Moldenke, Castanea 13: 113. 1948; Moldenke, Alph. List Cit. 4: 1155, 1226, & 1252. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 27 & 198; Moldenke, Résumé 33 & 472. 1959.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Le Roy Abrams (no. 5109) in Portola Valley, San Mateo County, California, on June 2, 1914, and is deposited in the Dudley Herbarium at Stanford University. It has been collected in flower and fruit in June. In all, 4 herbarium specimens, including the type, and 3 mounted photographs have been examined.

Citations: CALIFORNIA: San Mateo Co.: Abrams 5109 (Du--72837--type, F--photo of type, N--photo of type, Z--photo of type). Santa Barbara Co.: Eastwood 579 (Gg--31343). Tuolumne Co.: A. L. Grant s.n. [Grant Ranch, near Columbia, June 11, 1915] (Po). County undetermined: M. L. Kendall s.n. [4-13-23] (Po--17416).

VERBENA LASIOSTACHYS var. SCABRIDA Moldenke, Am. Midl. Nat. 24: 753. 1940.

Synonymy: Verbena lasiostachys scabrida M. S. Baker, Part. List Seed Pl. North Bay 33. 1945.

Bibliography: Perry, Ann. Mo. Bot. Gard. 20: 291. 1933; Moldenke, Am. Midl. Nat. 24: 753. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 15, 80, & 101. 1942; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Jepson, Fl. Calif. 3 (2): 381—382. 1943; M. S. Baker, Part. List Seed Pl. North Bay 33. 1945; Moldenke, Alph. List Cit. 1: 3 & 25. 1946; Moldenke, Phytologia 2: 329, 330, & 383. 1947; Moldenke, Castanea 13: 113. 1948; Moldenke, Alph. List Cit. 2: 467, 473, 474, 479, 482, 483, 570, & 609 (1948), 3: 720, 732, 770, 794, 871, 912, & 976 (1949), and 4: 1099, 1119, 1127, 1138, 1172, 1193, 1225, 1226, 1232, 1244, 1245, & 1652. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 27 & 198. 1949; Moldenke, Résumé 32, 33, 368, & 472. 1959; Moldenke, Phytologia 8: 144. 1961; Moldenke, Résumé Suppl. 3: 8. 1962.

This variety differs from the typical form of the species in having the mature leaves decidedly scabridous on the upper surface.

The type of the variety was collected by Samuel Bonsall Parish (no. 11590) in a dry meadow at Monterey, Monterey County, California, in August, 1917, and is deposited in the herbarium of Pomona College at Claremont. The plants so designated may actually prove to be a hybrid with V. robusta Greene, which they closely resemble. The plants often have their bractlets as long as the calyx (cfr. C. V. Meyer 240 at the University of California), as in that species, not shorter as in typical V. lasiostachys; yet Bradshaw 68, Hoover 3812, C. V. Meyer 240, and L. C. Wheeler 3315, with their open elongated spikes, are surely not conspecific with V. robusta!

The variety has been collected on dry sunny flats and dry mesas, in sloughs and dry meadows, on damp banks and stream banks, along rivers and wet roads, and on damp sunny south slopes, at altitudes of 8 to 3500 feet, in flower and fruit from May to October. Herbarium material has been misidentified and distributed under the names V. lasiostachys Link, V. prostrata R. Br., and V. robusta Greene. Material of L. C. Wheeler 3315, Wiggins 8957, and C. B. Wolf 2252 has been cited by me herein also under V. lasiostachys and its var. septentrionalis and should be re-examined; it will probably all prove to be var. scabrida. Perry (1933) cites specimens of G. T. Butler 1621 in the Missouri Botanical Garden and United States National herbaria as typical V. lasiostachys.

In all, 53 herbarium specimens, including the type of both names involved, and 2 mounted photographs have been examined by me.

Citations: OREGON: Curry Co.: Kildale 6055 (Du). Jackson Co.: C. B. Wolf 963 (Du—159333). CALIFORNIA: Alameda Co.: Wiggins

8957 (Du--266760, Gg--310868, Rs--23159, Se--52144). Colusa Co.: *R. Stinchfield 375* (Du--73690, N, Po--63857). Fresno Co.: *J. T. Howell 34053* (Z), *34090* (Gg); *J. McDonald s.n.* [Big Sandy Creek, June 1915] (Gg--31342, W--1089985). Lake Co.: *M. S. Baker 8677* (N); *Bradshaw 68* [U. S. Dept. Agr. Forest Serv. 20535] (Ca--124401); *R. F. Hoover 3812* (Ca--766869, N, N); *Schulthess s.n.* [July 3, 1931] (Du--274040). Los Angeles Co.: *Abrams 2481* (Du--24214, N, Po--156337). Monterey Co.: *J. T. Howell 6539* (Gg--207494); *S. B. Parish 11590* (Ca--205362--isotype, N--photo of type, Po--63863--type, Z--photo of type); *L. W. Reinecke s.n.* [September 5, 1937] (Ca--770047); *L. C. Wheeler 4294* (Po--222439). San Benito Co.: *J. T. Howell 11548* (Gg--212567, N). San Diego Co.: *C. V. Meyer 240* (Ca, Ca--488893); *C. B. Wolf 2252* (Ba, Du--207790, Gg--173929, Rs--9996). San Mateo Co.: *Barry 215* (Du--279302). Santa Clara Co.: *Newell s.n.* [Los Gatos, June 18, 1914] (Gg--31353); *Rotter 17* (W--308427). Santa Cruz Co.: *J. T. Howell 11615* (Gg--212563, Rs--8477); *H. A. Walker 730* (Po--126474). Siskiyou Co.: *G. D. Butler 1621* (Du--24207, Po--69590); *Eastwood 2102* (Gg--31357); *Kildale 9194* (Du); *L. S. Rose 45098* (Gg--329475, Go); *L. C. Wheeler 3315* (Ca--882795, Gg--233041, Po--211271, Rs--13898). Tuolumne Co.: *Mrs. W. J. Williamson 189* (Ca--882797). Ventura Co.: *J. T. Howell 1028* (Rs--653).

VERBENA LASIOSTACHYS var. SEPTENTRIONALIS Moldenke, Am. Midl. Nat. 24: 753. 1940.

Synonymy: *Verbena lasiostachys septentrionalis* M. S. Baker, Part. List Seed Pl. North Bay 33. 1945. *Verbena nevadensis* Kearney ex Moldenke, Résumé 370, in syn. 1959. *Verbena prostrata* Benth. ex Moldenke, Résumé 372, in syn. 1959 [not *V. prostrata* Ait., 1947, nor R. Br., 1812, nor G. Savi, 1802].

Bibliography: Jepson, Erythrea 1: 12. 1893; Perry, Ann. Mo. Bot. Gard. 20: 291. 1933; Moldenke, Am. Midl. Nat. 24: 753. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 15, 80, & 101. 1942; Jepson, Fl. Calif. 3 (2): 381--382. 1943; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Castanea 10: 40. 1945; Moldenke, Am. Journ. Bot. 32: 610. 1945; M. S. Baker, Part. List Seed Pl. North Bay 33. 1945; Moldenke, Alph. List Cit. 1: 25, 81, 82, 108, 109, 122, 153, 193, 243, 255, 265, & 285. 1946; Moldenke, Phytologia 2: 330 (1947) and 2: 478. 1948; Moldenke, Castanea 13: 113. 1948; Moldenke, Alph. List Cit. 2: 438, 454--457, 470, 473, 478, 480, 483, 488, 492, 493, 519, 525--527, 571, 577, 584, 595, 597, 601, 606, 609, 634, & 644 (1948), 3: 720--722, 769, 770, 783, 788, 794, 801, 803, 828, 841, 843, 870, 871, 948, 972, 976, & 977 (1949), and 4: 981, 995, 1002, 1003, 1118, 1119, 1127, 1137, 1138, 1155, 1166, 1173, 1174, 1177, 1198, 1199, 1211, 1215, 1216, 1222--1230, 1232, 1236, 1238--1242, 1244--1248, 1252, 1253, 1259, 1261, 1288, & 1289.

1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 14. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 27 & 198. 1949; Moldenke, Am. Midl. Nat. 59: 342 & 361. 1958; Moldenke, Résumé 32, 33, 368, 370, 372, 421, & 472; Moldenke, Résumé Suppl. 2: 10 & 12. 1960; Moldenke, Phytologia 8: 120, 121, & 144 (1961) and 8: 206, 267, 279, 280, 396, & 407. 1962; Moldenke, Résumé Suppl. 3: 8 (1962) and 6: 3. 1963; Moldenke, Phytologia 8: 487 (1963), 9: 215 (1963), and 9: 404. 1963.

This variety differs from the typical form of the species in having its calyx in all only 3—4 mm. long. It is said to be a decumbent perennial or nearly erect herbaceous perennial, 8 inches to 3 feet tall, often growing in clumps. The flowers are described as blue or purple. The cocci are dorsally 3- or 4-striate and slightly reticulate, the commissural faces minutely dotted.

The type of the variety was collected by Carl Clawson Epling (*no. 5445*) near Medford, Jackson County, Oregon, in August, 1922, and is deposited in the herbarium of the University of California at Los Angeles. The type of *V. nevadensis* is *Kennedy & Doten 241* from Nevada County, California, deposited in the herbarium of the California Academy of Sciences at San Francisco. A note appended to *Baker 7904* states that it "does not seem to fit any sp. in manual".

The variety has been found on moist banks and bottomlands, in winter stream beds and valley flats, on damp sunny south slopes and moist creek bottoms, in semi-shade of river bottoms, in open places in redwood forests, in old rock quarries and woods, in 2—3 inches of water on muddy shores of lakes, in wet soil and partial shade, on dry open hills and dry banks along railroads, on streambanks and sandbars, in dry or wet ground of stream margins, sandy dry flood beds, waste ground, gravel bars, damp banks, along roadsides and around springs, on dry mesas and dry sunny flats, in grassy moist woods and moist ground, in grassy areas of mixed chaparral and *Quercus agrifolia* woodland, on hills and sandy dry riverbanks, on slopes in chaparral, in dry open ground, growing in fine soil, loam, decomposed granite, or gravelly clay-loam porphry, at altitudes of 150 to 7000 feet, flowering and fruiting from April to October and in December. It is said sometimes to grow in clumps 2 feet tall. Short & Johnson report it as "locally frequent in open woods in woodland-grass association with *Bromus rubens*, *B. mollis*, and *Quercus douglasii*", while Tracy says that he found it to be "in open ground much more common [Mendocino County] than farther northward". Cooke describes it as "common around springs" in Siskiyou County; Benson found it in the Transition and Upper Sonoran Zones; Blankinship describes it as an "introduced roadside weed"; while Ingram notes "not observed to be grazed, with timothy, redtop, velvet grass, Kentucky bluegrass as a weed in dry meadows." Munz found it "infrequent near small streams in Yellow Pine Forest" and "scattered in sun on seepy hillside in yellow pine association." Gorman asserts that it is common along roadsides and waste places in Jackson County, Oregon, while Ewan found it in dry grassy clearings in Baccharetum with Navarretia and Gnaphalium, and frequent in moist soil of backwater channels. Tracy refers to it as "scattered" in Humboldt County, while Dennis found it on "dry open ground with Hypericum perforatum and Aira caryophyllea."

Common names recorded for the plant are "common vervain", "verbena", "vervain", and "wild verbena".

Herbarium material of this variety has been misidentified and distributed under the names V. bracteosa Michx., V. canescens H.B.K., V. hastata L., V. lasiostachya Link, V. lasiostachys Hook. & Arn., V. lasiostachys Link, V. menthaefolia Benth., V. prostrata R. Br., V. robusta Greene, and "Labiatae".

It should be noted here that K. Brandegee s.n. [Jolon, June 19, 1908], Culberson H.210, and Wilkes 1661 are mixtures with V. abramsi Moldenke, while G. R. Vasey s.n. [California, 1875] is a mixture with something non-verbenaceous. The Brandegee specimens are very perplexing -- their similarity may indicate hybridity. Butler 1621 is described by the collector as "erect or decumbent, never prostrate" and is probably var. scabrida; re-examination of Wheeler 3315 will probably also show that this collection is var. scabrida. On the other hand, the L. C. Wheeler 666 material cited under typical V. lasiostachys will probably prove to be var. septentrionalis.

The Davy & Blasdale 5892 collection cited below may not actually have come from Mendocino County. Its label merely states "Mendocino, Humboldt, and Del Norte Counties" with no specific locality designated.

Perry (1933), under V. prostrata R. Br., cites 16 additional specimens not as yet seen by me: OREGON: Douglas Co.: J. C. Nelson 2669 (G); J. W. Thompson 4412 (E). Jackson Co.: C. Epling 5445 (E--isotype). Josephine Co.: J. T. Howell s.n. [Grant's Pass, July 3rd, 1887] (F). County undetermined: Hammond 322 (E, W). CALIFORNIA: Amador Co.: G. Hanson 964 (E). Los Angeles Co.: W. H. Brewer 31 (G). San Diego Co.: Abrams 3787 (E, F, G, N). Santa Barbara Co.: Elmer 3846 (E). Sonoma Co.: A. A. Heller 5785 (E, F, G).

In all, 279 herbarium specimens, including the types of all the names involved, and 2 mounted photographs have been examined by me.

Citations: OREGON: Curry Co.: W. H. Baker 4207 (Ca--773283, Gg--35345); Priebe s.n. [August 15, 1937] (Or--35741). Douglas Co.: J. C. Nelson 2669 (Pl--103659); M. E. Peck 20215a (Gg--302834); J. W. Thompson 4412 (Du--179613); L. F. Ward 104 (W--404609). Jackson Co.: Dennis & Dennis 2255 (Hi--204053); C. Epling 5445 (La--type, N--photo of type, Z--photo of type); Gorman 4151 (Du--38971, Mn--16974, Pl--103658); E. W. Hammond 322 (W--333831); J. W. Thompson 12409 (Se--15934). Josephine Co.: Applegate 8703 (Du--248339), 11264 (Du--287874, Du--289387); W. W. Canby 71 (Or-

8868); H. L. Dale s.n. [July 4--16, 1919] (Du--99667); L. F. Henderson 796 (Or--8869); J. T. Howell 174 (W--1323119), 272 (Or--8870), s.n. [Grant's Pass, June 24th, 1884] (Bc, Du--91136, Pa, Se--21482), s.n. [Grant's Pass, July 3rd, 1887] (Br, Ca--104846, Up--17120); T. Howell 1249 (Ka); Ingram 1197 (Or--23904); Kildale 6314 (Du), 8943 (Du); Overlander s.n. [July 24, 1940] (Or--52623); C. V. Piper 6160 (W--527761). Klamath Co.: Gilkey s.n. [6/24/27] (Or--21633); Ingram 1759 (Or--23905). Linn Co.: Rone 202 (Du--24206). County undetermined: Hammond 322 [Pleasant Valley near Winner] (N); J. T. Howell s.n. [Woodville, May 18, 1890] (Pl-105635); J. O. Stewart 71 (Or--16623). CALIFORNIA: Alameda Co.: Carruth s.n. [E. Oakland Hills, July 1901] (Gg--31359); L. Constance 448 (Ca--521623); Drew s.n. [Oakland, June 25, 1889] (Ca--76170); Michener & Bioletti s.n. [Oakland, June 1891] (W--517995); C. O. Smith s.n. [vicinity of Berkeley, June 4/06] (Lu); C. V. Smith s.n. [Berkeley, June 4, 1906] (Ca--129463). Amador Co.: G. Hansen 964 (Du--24215). Butte Co.: R. M. Austin 299 (W--285211). Calaveras Co.: Eggleston 9724 (W--881267); G. Hansen 1823 (W--338406). Colusa Co.: M. S. Baker 10138 (N). Contra Costa Co.: Ewan 9719 (En, Hp, Rs--29666, Se--52532). Del Norte Co.: E. A. McGregor s.n. [Aug. 8, 1921] (Du--137789). Fresno Co.: M. K. Clemens s.n. [Wood's Creek, July 19, 1910] (Po--69912); W. B. Duncan 164 (Du--130877); J. McDonald s.n. [Big Sandy Valley, June 1, 1932] (Gg--195255). Glenn Co.: M. S. Baker 10022 (N); J. T. Howell 19170 (Gg--312336); R. E. Nelson 159 (Ca--1178). Humboldt Co.: L. D. Benson 488 (Po--267637); H. P. Chandler 1353 (Ca--154273); Chesnut & Drew s.n. [Hy-Am-Pum, July 21, 1888] (Ca--35085); L. Constance 660 (Pl--59990); De Cou s.n. [6.11.99] (Up); C. D. Duncan s.n. [Sept. 22, 1920] (Du--125376); Kildale 2158 (Du--161281); C. C. Marshall s.n. [1888] (Ca--25158); J. P. Tracy 2775 (Ca--154022, Hi--210193), 12632 (Ca--585977, Du--260088), 12965 (Ca--585990). Kern Co.: L. D. Benson 3640 (Du--218707, Po--267643, Se--21505); Coville & Funston 1110 (W--71921); Nobs & Smith 472 (Ca--191996); Short & Johnson S.244 [U. S. Dept. Agr. Forest Serv. 21037] (Ca--137387); Weston 156 (Gg--139553, Gg--139575), 685 (Gg--145960). Lake Co.: L. D. Benson 571 (Po--267638); Bentley s.n. [May 28, 1917] (Du--85487); Blankinship s. n. [Kelseyville, June 12, 1924] (Gg--165153); Bolander 2683 (W--322398); Cleveland s.n. [Allen Springs, June 1882] (Sd--6785); A. A. Heller 5919 (Du--24212, Du--75582, W--417297); Herb. Cleveland s.n. [Hough Springs, June 13, 1882] (Sd--6789); J. T. Howell 21066 (Gg--327756); Jepson 18935 (Ca), 21227 (Ca); Jussel 323 (Gg--213274); Leithold s.n. [July 1893] (Du--9553); Munz 22302

(Gg—418633); P. O. Schallert 356, in part (Hi—30439); Schulthess s.n. [Kelseyville, July 3, 1931] (Ca—635118); A. S. Stinchfield s.n. [near Bartlett Springs, August 1916] (Du—76555, Gg—31336, Po—63859); J. Torrey 417 (T). Los Angeles Co.: Abrams 1487 (Du—24209); J. H. Barber 35 (Ca—25168); Braunton 100 (W—465105), 378 (W—465366); W. H. Brewer 31 (W—322399); Eastwood 96 (Gg—31365); Epling & Epling s.n. [Palmdale, May 1925] (Or—30299, Or—30348); Ewan 5504 (En), 8401 (Ca—586863), 10821 (En, Ms, Rs—29315, Se—52230); G. B. Grant 4119 (Du—75584); Nevin s.n. [Wilson's Lake, 1904] (Du—77579); S. B. Parish 1983 (Du—91135); Pupils of L. A. High School s.n. [near "The Palms", May 1901] (Ca—76171), s.n. [May 1902] (Ca—76169); M. Reed s.n. [Pomona, 8/17/1895] (Ka); L. C. Wheeler 666 (Du—234656, En). Mendocino Co.: O. M. Clark 5286 (B); Davy & Blasdale 5892 (Ca—154272, W—668959); C. D. Duncan 98 (Du); Eastwood 12692 (Gg—138948), 15187 (Gg—158669); A. Hastings s.n. [May 19, 1940] (Ro); Jepson 7643 (Ca); Jussel 1 (Gg—195432), s.n. [May 1, 1931] (Mn—20896); McMurphy 320 (N, W—610874), 820 (Du—24201); L. S. Rose 34261 (Gg—237858, Hp, I, S); Stahelin s.n. [U. S. Dept. Agr. Forest Serv. 19562] (Ca—124406); J. P. Tracy 5059 (Ca—203966); H. A. Walker 211 (Ca—112748); Winblad s.n. [June 22, 1941] (Gg—310867); C. B. Wolf 1268 (Du—166027); H. S. Yates 3577 [U. S. Dept. Agr. Forest Serv. 1732] (Ca—124417). Monterey Co.: E. K. Abbott s.n. [Monterey] (Gg—31350); Antisell 187 (Du—177389, T); M. S. Baker 7904 (Ro); K. Brandegee s.n. [Jolon, June 19, 1908], in part (Ca—112914), s.n. [Foot of Jolon Grade, June 7, 1909] (Ca—450183); Dudley s.n. [May 1937] (Se—69269); Hartweg 1924/418 (Lu); Holman s.n. [Santa Barbara Forest, May 24, 1933] (Ca—505133); J. T. Howell 40045 (Z); Morrow, Cook, & Cook 64 (Ca—916545); Munz 20892 (Gg—418632); Patterson & Wiltz s.n. [June 28, 1907] (Du—24208, Rs—6562); R. A. Plaskett 98 (Ca—104850); A. D. Randall 356 (Du—13316, Po—127827); Raven 8796 (Gg—408163); P. O. Schallert 356, in part (Hi—30363). Nevada Co.: Doten 241 (Ca—66442); M. E. Jones 2598 (B, Go, Po—70672); Kennedy & Doten 241 (Gg—31334, N); H. M. Pollard s.n. [July 1936] (Gg—347558). Plumas Co.: Sutliffe s.n. [Gold Valley, Sept. 1920] (Gg—31361). San Benito Co.: Eastwood 6971 (Gg—31349); V. F. Hesse 2606 (Ca—170318); Lathrop s.n. [June 7, 1903] (Du—86021); Raven 2171a (N). San Bernardino Co.: H. M. Hall 1475 (Ca—64386); Raven & Wedberg 11221 (Gg—409380). San Diego Co.: Abrams 3787 (Du—24202, Po—156120); Alderson 8464 (Ca—104848), s.n. [Witch Creek, 1893] (Ca—25166), s.n. [Witch Creek, June 1921] (Ca—25155); T. S. Brandegee s.n. [Julian, June 18, 1894] (Ca—104844); Collins & Kempton 164 (W—882212); M. E.

Jones s.n. [Palomar Mt., July 27, 1926] (Po--122652); S. G. Stokes s.n. [June 1895] (Du--24200). San Luis Obispo Co.: J. H. Barber s.n. [Paso Robles, April 23, 1899] (Ca--57554); Eastwood 13617 (Gg--139973); T. M. Hendrix 269 [U. S. Dept. Agr. Forest Serv. 20462] (Ca--124412), 1043 [U. S. Dept. Agr. Forest Serv. 25146] (Ca--124414); Herb. Calif. Polytech. School s.n. [Poly Canon, May 14, 105] (Ca--456153); H. C. Lee 972 (Ca--124408); Nobs & Smith 868, in part (Gg--417907); Edw. Palmer 342 (Ca--177630); L. A. Summers s.n. [March 1884] (Au--175731); Mrs. R. W. Summers s.n. [June 13, 1887] (Ca--52303); Twisselmann 2164 (Gg--399250). San Mateo Co.: K. Brandegee s.n. [Moss Beach, July 26, 1908] (Ca--185366). Santa Barbara Co.: M. S. Baker 14 (Ca--450177); Mrs. E. Cooper s.n. [Sa. Barbara, June 1879] (W--147586); G. W. Dunn 566 (W--1323120); Eastwood 166 (W--610050), 13688 (Gg--139682); Elmer 3846 (Du--24211, Po--49421, Vt, W--466049); W. A. Peterson 307 [U. S. Dept. Agr. Forest Serv. 16449] (Ca--124409); H. M. Pollard s.n. [Aug. 30, 1957] (Gg--416659); Rothrock s.n. [Santa Barbara, June 1875] (W--71920). San Francisco Co.: A. Kellogg s.n. [near San Francisco, 1866] (W--322403). Santa Clara Co.: Belshaw 2204 [U. S. Dept. Agr. Forest Serv. 16106] (Ca--124402); L. D. Benson 167 (Po--267636); W. R. Dudley s.n. [June 10, 1897] (Du--278633); H. K. Sharsmith 1139 (Ca--724394), 3187 (Ca--724513). Santa Cruz Co.: Akey 50 [U. S. Dept. Agr. Forest Serv. 11651] (Ca--124411); Ewan 9062 (En). Shasta Co.: M. S. Baker s.n. [Morley's Station, May 22] (Ca--450178); Baker & Nutting s.n. [Morley's Station, May 22, 1894] (Ca--25191, W--239798); Drew s.n. [June 1916] (Du--69497); Eastwood & Howell 7886 (Gg--277933); Johannsen 46 [U. S. Dept. Agr. Forest Serv. 2535] (Ca--124405). Sierra Co.: E. D. Cantelow 4526 (Gg--348277). Siskiyou Co.: D. Barbe 17 (Ca--37353); G. D. Butler 83 (Ca), 1621 (Ca--164109, W--669470); W. B. Cooke 15149 (Ca--45318, Du--277308, N, Or--42076); L. E. Smith s.n. [Yreka, Aug. 1912] (Gg--31355); ?L. C. Wheeler 3315 (La); C. B. Wolf 1047 (Du--159106, Rs--15799). Sonoma Co.: Carruth s.n. [Russian River, July 1800] (Gg--31360); A. A. Heller 5785 (Du--24199, Du--75583, N, Po--64648, W--416795); Jepson 9486 (Ca); Rattan s.n. [May 17, 1877] (Du--19183), s.n. [Guerneville, June 17, 1877] (Gg--414251). Tehama Co.: Munz 16963 (Gg--376351, N). Trinity Co.: Mrs. H. C. Cantelow 1728 (Gg--348276); Kildale 10931 (Du--215685). Tulare Co.: M. Bebb 373 (Ok); Culberson H. 210, in part (Gg--31352); W. Fry 333 (Ca). Tuolumne Co.: A. L. Grant s.n. [Columbia, June 9, 1915] (Ca). Ventura Co.: Cobb 153 (Ca--450181); Evermann s.n. [Santa Paula, 1881] (W--617847); Gifford 197 [U. S. Dept. Agr. Forest Serv. 4525] (Ca--124415); Hubby s.n. [April 24, 1894] (Gg--345632); Simontacchi 74 [U. S.

Dept. Agr. Forest Serv. 13573] (Ca--124410); *H. J. Thompson 2037* (Au); *C. B. Wolf 2037* (Ca--527197, Du--231082, Rs--1755). County undetermined: *Mrs. R. M. Austin s.n.* (Ca--104847); *Eastwood s.n.* [Knight's Valley, May 8, 1900] (Ca--104852); *Edw. Palmer 342* [Cent. Calif., 1876] (W--71926), *s.n.* [s.e. Calif., 1876] (Du--200648); *G. R. Vasey s.n.* [California, 1875] (W--71923); *Wilkes 1661*, in part [Lower Sacramento] (W--71925). LOCALITY OF COLLECTION UNDETERMINED: *Herb. Coll. of Hawaii s.n.* (Bi, Bi, Bi).

xVERBENA LECOCQI Moldenke, Phytologia 2: 148. 1946.

Synonymy: *Verbena hispida x prostrata* Dermen, Cytologia 7: 170. 1936. *Verbena hispida* Ruíz & Pav. x *V. lasiostachys* Link ex Moldenke, Résumé 366, in syn. 1959. *Verbena lasiostachys* Link x *Verbena hispida* Ruíz & Pav. ex Moldenke, Résumé 368, in syn. 1959.

Bibliography: Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 2: 148. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 24 & 25. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 68. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 164 & 198. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2211. 1951; Moldenke, Am. Midl. Nat. 59: 354. 1958; Moldenke, Résumé 223, 366, 368, & 472. 1959; Moldenke, Phytologia 8: 121 (1961) and 9: 296. 1963.

This is the artificially produced hybrid between *V. hispida* Ruíz & Pav. and *V. lasiostachys* Link, produced in Massachusetts by Dermen in 1936. It is named in honor of Henri Lecocq, professor of natural history and director of the botanical garden of Clermont-Ferrard, author of a work on the phytogeography of Europe. Its characters are intermediate between those of the two parental species. These two parental species are not known to occur together in the wild state anywhere, so the hybrid is not to be expected in the natural state. In view of the lack of attractiveness exhibited by both "parents", the hybrid is not likely to have any horticultural merit.

VERBENA LILACINA Greene, Bull. Calif. Acad. 1 (4): 210. 1885.

Bibliography: Greene, Bull. Calif. Acad. 1 (4): 210. 1885; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Perry, Ann. Mo. Bot. Gard. 20: 249, 250, 312, 340--341, & 355. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101. 1942; Moldenke, Castanea 13: 114. 1948; Moldenke, Alph. List Cit. 3: 712 & 787 (1949) and 4: 1165 & 1225. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33, 34, & 198. 1949; Moldenke, Résumé 39, 40, & 472. 1959; Moldenke, Résumé Suppl. 3: 10. 1962.

Herb; stems erect, much branched, 0.5--1 m. tall, very sparsely hirsute throughout or glabrous except just below the spike; leaves decussate-opposite; leaf-blades 3--5 cm. long, contracted at the base into a margined petiole, bipinnatifid or the upper ones pinnatifid, with remote divisions and the ultimate lobes chiefly linear and acute, somewhat scabrous and strigillose on both surfaces, rugose above; midrib prominent beneath; spikes fascicle-like, cymosely arranged, long-pedunculate, short, stout, dense; bractlets somewhat shorter than the calyx, lanceolate-setaceous, pubescent, ciliate-margined; calyx about 7 mm. long, appressed-pubescent, short-hirsute along the veins, the lobes unusually long, 2.5--3 mm. in length, attenuate at their apex into subulate-setaceous teeth; corolla lavender, its tube protruding very little beyond the calyx; corolla-limb about 10 mm. wide, the lobes emarginate; anthers not glandular; sterile style-lobe projecting well beyond the stigmatic surface; schizocarp deeply depressed at the apex; cocci almost smooth, slightly enlarged at the base, the commissural surface muricate-scabrous, not reaching the tip of the nutlet.

The type of this endemic species was collected by Edward Lee Greene on Cedros Island, on April 29, 1885, and is deposited in the Gray Herbarium of Harvard University. The species has been recorded by Perry and by myself from Baja California, but this was on the basis of the collections cited below from Cedros Island, since that island politically is part of Baja California, Mexico. The species is known only from Cedros, and has been collected in canyons and on arroyo floors at an altitude of 500 feet, in flower and fruit in March, April, and August. The Haines & Hale collection cited below is said to be a topotype. Anthony refers to the species as "common in canons."

Perry (1933) says "This is an anomalous species of uncertain relationship. It has an erect open habit with more or less glabrous stem and long internodes somewhat suggesting V. neomexicana (§Verbenaca); nevertheless, the short stout dense spike does not point to an affinity with this section. Although the anthers are not glandular, the sterile style-lobe protrudes well beyond the stigmatic surface, and, in mature fruit, the style appears to have been inserted in a deep depression at the apex of the schizocarp; hence the species is regarded provisionally as a member of the section Glandularia." She cites 6 additional specimens not as yet seen by me: CEDROS ISLAND: A. W. Anthony 288 (E, F, G); Greene s.n. [29 April 1885] (G); Edw. Palmer 677 (F), s.n. [1889] (G).

In all, 25 herbarium specimens have been examined by me.

Citations: CEDROS ISLAND: A. W. Anthony 35 (Ca--124664), 78 (Du--24190), 288 (Du--24188, Me, W--313844); T. S. Brandegee s.n. [April 1, 1897] (Ca--104842); E. L. Greene s.n. [May 1, 1885] (Ca--104843); Haines & Hale s.n. [9 March 1939] (Ca--971567, Du--356562, Gg--384613, Ld, Rf, W--2130844); H. L. Mason s.n. [1925] (Gg--146931); R. V. Moran 3017 (Ca--15258); Edw. Palmer 677 (Br, C, Ca--124665, Gg--31370, Me, Pa, S, W--71980); J. N. Rose 16155 (N, W--638229).

VERBENA LILLOANA Moldenke, Phytologia 3: 176. 1949.

Bibliography: Moldenke, Lilloa 10: 346. 1944; Moldenke, Phytologia 3: 176 (1949) and 3: 290. 1950; E. J. Salisb., Ind. Kew.

Suppl. 11: 263. 1953; Moldenke, Résumé 127 & 472. 1959; Moldenke, Phytologia 8: 416 & 419. 1962; Moldenke, Résumé Suppl. 6: 7. 1963; Moldenke, Phytologia 9: 397. 1963.

Herb; stems slender, obtusely tetragonal, often canaliculate between the angles, minutely pilosulous or subglabrescent; nodes obscurely annulate with a band of denser hairs; principal internodes 6.5—7 cm. long; leaves decussate-opposite, usually with abbreviated branchlets in their axils; petioles slender, 1--2 cm. long, more or less margined, minutely pilosulous or glabrescent; leaf-blades submembranous, uniformly green on both surfaces, ovate in outline, 3—5 cm. long, 1.5—4 cm. wide, more or less tripartite, each division deeply incised-lobed, the larger lobes toothed near their apex, very minutely scattered-pilosulous on both surfaces or glabrescent; midrib and the 4 pairs of secondaries very slender, plane above, flattened beneath; veinlet reticulation very sparse and inconspicuous on both surfaces; inflorescence terminal, solitary; peduncles elongated, about 9 cm. long, minutely pilosulous with scattered short hairs or glabrescent; spikes dense-flowered except for the lowest 2 or 4 flowers which are widely separated (at least after anthesis); bractlets lanceolate, about 7 mm. long, long-attenuate at the apex, somewhat ciliate-margined, otherwise glabrate; calyx-tube about 7 mm. long, pilosulous-puberulent, surmounted by 5 unequal apiculate teeth about 2 mm. long; corolla blue or bluish to lilac, violet, or purple, its tube about 7 mm. long, obscurely appressed-pilosulous on the outer surface, the limb about 6 mm. in diameter, the larger lobes asymmetrically emarginate at the apex.

The type of this species was collected by Santiago Venturi (no. 4607) at Las Panas, at an altitude of 3000 meters, dept. Chicligasta, Tucumán, Argentina, on November 22, 1926, and is deposited in the Britton Herbarium at the New York Botanical Garden. The Monetti and Lillo collections cited below were reported in Lilloa 10: 346 (1944) as V. calliantha Briq. in error. Herbarium material has also been misidentified and distributed under the names V. cabrerae Moldenke, V. dissecta Willd., and V. erinoides Lam.

The species has been found in fields, meadows, and quebradas at altitudes of 1700 to 3000 meters, blooming in February, May, November, and December. In all, 14 herbarium specimens, including the type, have been examined by me.

Citations: ARGENTINA: Jujuy: Venturi 8356 (E—961971, N, W—1591404). Tucumán: Lillo 3989 [Herb. Inst. Miguel Lillo 31691] (N, Ug); Monetti s.n. [Herb. Inst. Miguel Lillo 31696] (N); O'Donell 4290 (N); Venturi 2898 (Du—372501, W—1591271), 4063 (W—1591431), 4607 (Ca—342572—isotype, Gg—158084—isotype, N—type, W—1343319--isotype, W—1591443—isotype).

VERBENA LINDBERGI Moldenke, Phytologia 2: 322--323. 1947.

Bibliography: Moldenke, Phytologia 2: 322--323. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94 & 198. 1949; Moldenke, Alph. List Cit. 3: 663, 750, & 846 (1949) and 4: 1124. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 110 & 472. 1959; Moldenke, Phytologia 8: 463. 1963.

Herb; stems 1 m. or more tall, branched above, obtusely tetragonal, hispidulous with reflexed hairs about 1 mm. long, wearing off at the base of the stem in age; branches decussate-opposite, slender, ascending, tetragonal, sulcate in drying, hispidulous like the stems; nodes annulate; principal internodes 5.5--14 cm. long; leaves rather sparse, decussate-opposite, sessile or subsessile; petioles, when present, 1--2 mm. long, short-hispidulous; leaf-blades chartaceous, dark-green above, slightly lighter beneath, oblong-lanceolate, 2--4 cm. long, 6--11 mm. wide, acute at the apex, abruptly acute or subtruncate at the base, rather remotely serrulate along the margins, the points of the appressed teeth 4--5 mm. apart on mature leaves, strigillose-scabrous with whitish antrorse bulbous-based hairs above, rather sparsely short-hispidulous along the venation beneath; midrib indiscernible above, very inconspicuously prominulous beneath, very slender; secondaries very slender, about 3 per side, ascending, indiscernible above, very indistinctly prominulous beneath; vein and veinlet reticulation indiscernible above, obscure beneath; inflorescence spicate, terminating each lateral branch and in a panicle of about 6 branches at the apex of the stem; peduncles slender, tetragonal, sulcate in drying, hispidulous, 1--7.5 cm. long, those terminating the branches usually quite short; spikes rather few-flowered, densely conglobate when young, elongating to about 1.5 cm. in fruit and the lower fruits then imbricate but not especially densely so; bracts in the terminal panicle foliaceous, lanceolate, 0.5--2 cm. long, 1--5 mm. wide, attenuate to the sharp apex, short-hispidulous on both surfaces, sessile, in decussate-opposite pairs; bractlets lanceolate, about 2.5 mm. long and 1 mm. wide, sparsely puberulent, the margins often ciliolate, attenuate at the apex, about half as long as the fruiting-calyx; calyx tubular, 4--5 mm. long, short-toothed, spreading-puberulent with antrorse hairs; corolla-tube about 5 mm. long, its limb about 1.5 mm. wide.

The type of this species was collected by Gösta A. Lindberg (no. 136) -- in whose honor it is named -- in swamps at Ribeiro dos Buggris, in the neighborhood of Caldas, Minas Gerais, Brazil, on November 1, 1854, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. It was originally identified as Keithia lavanduloides Benth. Specimens have also been misidentified and distributed as Verbena bonariensis L. The species apparently grows along shaded rivulets and in swampy places. All the known collections have been gathered in anthesis in November. The species is known only from Minas Gerais.

In all, 8 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Minas Gerais: Lindberg 136 (Br--type, F--photo of type, N--isotype, N--photo of type, Si--photo of type, Z--photo of type); Mosén 641 (N, S); Regnell II.205x (N, S); Widgren 898 (W--1323052), s.n. [Caldas, 1845] (S).

VERBENA LINDMANII Briq., Arkiv Bot. Stockh. 2 (10): 12--14, pl. 3A. 1904.

Synonymy: *Verbena lindmani* Briq. ex Moldenke, Résumé 368, in syn. 1959.

Bibliography: Briq., Arkiv Bot. Stockh. 2 (10): 12--14, pl. 3A. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Stapf, Ind. Lond. 6: 430. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 101. 1942; Augusto, Fl. Rio Grande do Sul 211, 215, & 233. fig. 100. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 69. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 3: 665, 703, 745, & 840 (1949) and 4: 1248, 1249, & 1251. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 106, & 198. 1949; Moldenke, Phytologia 3: 75 & 76. 1949; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Rambo, Sellowia 6: 60, 84, & 153. 1954; Angely, Fl. Paran. 7: 13. 1957; Moldenke, Résumé 110, 127, 368, & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Reitz, Sellowia 13 (13): 110. 1961; Moldenke, Phytologia 8: 147 & 148 (1961) and 9: 113. 1963.

Illustrations: Briq., Arkiv Bot. Stockh. 2 (10): pl. 3A. 1904.

Suffrutescent perennial herb, 0.4--1.1 m. tall, with an *Ephedra*-like aspect; stems woody, short, tough, incrassate; aerial branches many, issuing from the stem, woody at the base, green, tough, acutely tetragonal, mostly slender and not at all alate, rarely stout and alate, naked, ascending-erect, smooth, glabrous, glaucescent; nodes contracted-articulate, annulate; lowermost internodes very short and abbreviated, 3--10 mm. long, the upper ones 3--10 cm. long; lower leaves sessile or subsessile, small, 1--2 cm. long, 5--8 mm. wide, ovate, toughish, varying from obtuse or subobtuse to acute at the apex, convex along the margins, shallowly and distantly subcrenate-dentate, rounded or truncate at the base, bright-green and sparsely strigose with antrorse hairs on both surfaces, penninerved; upper leaves reduced to very minute and soon deciduous scales, ovate-acuminate, entire, scarcely 2 mm. long; venation noticeable only on the larger lower leaves, the midrib very slender, flat above, prominulous beneath, the secondaries few, very slender and short, somewhat prominulous beneath; spikes dark-violet, usually reduced to ovate densely flowered heads 1--1.5 cm. long and about 6 mm. wide, solitary or in sessile clusters of 3 or a few only at the tips of naked branches, usually borne in the axils of very small caducous scale-like bracts 3--4 mm. long, rarely clustered at the upper nodes, to 3 cm. long, sessile; bractlets ovate, acute at the apex, shorter than the calyx, 3--4 mm. long, antrorsely strigose-pubescent on the back; calyx angled-tubular, about 5 mm. long, with rather rigid antrorsely strigose hairs on the angles, otherwise very minutely puberulent between the veins, the rim 5-dentate with lanceolate subequal teeth much shorter than the tube (the posterior one slightly shorter than the rest), mostly about 2 mm. long and 0.6--0.7 mm. wide; corolla rose, lilac, purple, or violet, small, its tube cylindric to the base, slightly ampliate above, the lobes of the limb subequal, narrowly oblong, scarcely equaling the calyx-teeth; stamens 4, didynamous, inserted above the middle of the corolla-tube, included; anthers ovoid, all unappendaged, the thecae subparallel; ovary attenuate to an entire apex, ovoid, at anthesis completely 4-celled, the cells 1-ovulate; style short, about 2 mm. long, included, the apex very shortly 2-lobed, the posterior lobe acutely horn-like, the anterior one subpulvinate and papillose; ovules affixed laterally close to the base; fruit 3--3.5 mm. long, included by the calyx, dry, with a glabrous, smooth, indurated pericarp, somewhat compressed laterally, 4-celled below, the narrow cells separated by a prominent line, not coming apart at maturity, the upper one-third 4-alate; seeds erect, exalbuminous, filling the cells only in the lower part of the fruit.

The type of this curious species was collected in dry sandy-gravelly soil of open fields at Cachoeira, Rio Grande do Sul, Brazil, by Carl Axel Magnus Lindman — in whose honor it is named — on the First Regnellian Expedition (*no. A.1203*) on February 24, 1893. Briquet, in his original description, gives a very detailed account of the amazing fruit structure of this species, a structure which, he points out, is seen nowhere else in the genus even in its broadest sense. It is reminiscent of the monotypic genus *Stylodon* Raf. of the eastern United States. His comments are worth repeating here: "Cette remarquable espèce appartient au *Junciformes* Briq. de la section *Verbenaca*.....Elle est très voisine par son port des *Verb. sagittalis* Cham. et *V. ephedroides* Cham. Elle présente à peu près l'inflorescence et les organes floraux du premier, avec l'appareil végétatif du second (rameaux tetragones, à faces non profondémont creusées à angles non sunailés, dépourvus des scrobicules si caractéristiques pour le *V. sagittalis*). Main le *V. Lindmanii* s'ecarte en outre fortement des espèces précitées par l'organisation de son fruit.

"Normalement, le fruit des *Verbena* se décompose spontanément à la maturité en 4 akènes, tandis que dans le *V. Lindmanii*, les 4 méricarpes restent cohérents à la maturité et ne peuvent être séparés qu'avec peine sans endommager le fruit. Il est vrai que quelques Verveines, et cela précisément dans le groupe des *Junciformes* et des *Verticilliflorae* paraissent aussi présenter des fruits à akènes cohérents à la maturité. Il en est ainsi par exemple dans le *Verbena pseudo-juncea* Clos. Cependant le fruit de ces espèces ne saurait être rapproché de celui du *V. Lindmanii*. Dans ces *Verbena*, l'akène est généralement oblong, toujours entièrement creux, à cavité entièrement remplie par la semence. Au contraire, dans le *V. Lindmanii*, la cavité de l'akène et la semence qu'elle contient n'occupent guère que les deux tiers de la hauteur du fruit. Au dessus de ce niveau, les arêtes du péricarpe se prolongent sous forme de 4 ailettes, dépourvues de cavité intérieure. Une section passant par la partie inférieure du fruit montre donc 4 loges séparées par d'étroites arrêtes. Aux niveaux supérieurs, la section est cruciforme et les arêtes se

transforment en ailettes. Cettè organisation ne nous est connue dans aucune autre Verbénacée. Elle aurait mérité de motiver une coupe générique -- au même tetre que celles qui ont avec raison fair établir les genres Diostea, Neosparton, etc. -- si nous n'avions pas trouvé dans le V. sagittalis Cham. des caractères intermédiaires rattachant le V. Lindmanii au autres Verveines jonciformes ou éphédroïdes. Dans le V. sagittalis, en effet les 4 méricarpes oblongs sont également pourvus sur leurs marges d'une étroite ailette tout à fait semblable à celle du V. Lindmanii. Seulement la semence remplit tout le méricarpe; les 4 ailettes se rejoignent, en s'atténuant, au sommet du fruit, de telle sorte que la section transversale ne présente pas la disposition cruciale caractéristique pour le V. Lindmanii, laquelle n'est que l'exagération de l'organisation du V. sagittalis.* [*Nous avons pu étudier en détail le V. sagittalis Cham., que nous connaissons d'une façon très imperfaite, sur les nombreux échantillons de Sellow appartenant au Musée royal de Berlin, grâce à l'extrême obligeance de M. le Prof. I. Urban.]

"On ne saurait donc séparer génériquement le V. Lindmanii des Verveines éphédroïdes. Il n'en reste pas moins que nous sommes redevables à M. Lindman de la découverte d'un type nouveau, très intéressant à tous les points de vue."

The material of V. lindmanii from Argentina is far more husky than typical Brazilian material, has the inflorescences always aggregate not only at the apex of the branches but also at the upper nodes, and has the spikes much longer. More material from all parts of the range, however, is needed before it can be determined finally if varietal segregation is desirable. Augusto (1946) reports the species from Caracol, collected by Edésio, but his fig. 100, labeled "Verbena Lindmanii", actually represents V. alata Sweet.

Lindman's verbena has been found by collectors in dry sandy-gravelly soil of open fields, in campos and dry grassy campos, in rocky fields, and in grassy thickets, at altitudes of 6 to 1000 meters, blooming in October and from December to June, fruiting in March. It was found by Rambo in a region of 1.5--2 meters rainfall, temperature of 0--35° C., and rare snowfall. Malme found his material in grassy campos in mountain valleys. Gross annotated Jürgens 75 as "Verbena bonariensis recht schwache Individuen". Material has also been misidentified and distributed as V. sagittalis Cham. by Osten.

In all, 45 herbarium specimens, including the type collection of both names involved, and 4 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Dusén 30 (S), 36 (S), 2584 (Ja--46567), 7345 (S), 7598 (S), 7981 (S), 8324 (N, S, W--1481770), s. n. [Tamanduá, 24/11/1910] (S); Hatschbach 1181 (N), 2896 (N). Rio Grande do Sul: Jürgens 75 (B), 80 (B); Leite 244 (N); Lindman A.1203 (F--photo of isotype, N--isotype, N--photo of isotype, S--

isotype, S--isotype, Si--photo of isotype, Z--photo of isotype); Malme 573 (S), 573a (S); Moldenke & Moldenke 18678 (Es, Lg, N); Rambo 437 (Gg--354738, N, S), 27121 (N), 34722 (N, S), 39697 (W--2046883), 51557 (N, S, W--2102076), 57071 (S). Santa Catarina: Dusén 17938 (S); Rambo 49646 (S, W--2055058); Reitz C.874 [Herb. Jard. Bot. Rio Jan. 54385] (N, Rd). ARGENTINA: Misiones: Ekman 2023 (N); Grüner 803 [Herb. Osten 23179] (N, Ug); G. J. Schwarz 1387 (N), 1814 (N), 2676 (N).

VERBENA LIPOZYGIOIDES Walp., Repert. Bot. Syst. 4: 16. 1845.

Synonymy: Verbena lipozygioides β minima Walp., Repert. Bot. Syst. 4: 16. 1845. Verbena lipozygioïdes Walp. apud C. Gay, Hist. Fis. Chile Bot. 5: 11. 1849.

Bibliography: Walp., Repert. Bot. Syst. 4: 16. 1845; Schau. in A. DC., Prodr. 11: 551. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 11--12. 1849; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 104. 1907; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101. 1942; Moldenke, Alph. List Cit. 1: 40 (1946) and 3: 687. 1949; Moldenke, Phytologia 3: 75. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 198. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 57. 1951; Moldenke, Résumé 122 & 472. 1959; Moldenke, Résumé Suppl. 2: 12 (1960), 3: 39 (1962), and 4: 5. 1962; Moldenke, Phytologia 8: 204 & 401 (1962) and 9: 70 & 117. 1963; Moldenke, Résumé Suppl. 6: 6. 1963.

Perennial herb, suffruticose at the base, procumbent or to 15 cm. tall, canescent-strigose or -hispidulous to tomentose-pilose throughout, with glandular-viscid hairs intermixed; stems rooting at the base, tetragonal, nodose, many-branched; branches prostrate or ascending, short, slender, fastigiate, of equal length; leaves decussate-opposite or fasciculate, small, with short proliferations in their axils; petioles short; leaf-blades 6--15 mm. long, bipinnatifid-multipartite or pinnatipartite, glandular-pilose and canescent throughout, the segments very narrowly linear, short, obtuse at the apex, almost always entire, revolute- or subrevolute-margined, 1-nerved beneath, the midrib conspicuous on the lower surface; spikes terminal, subsessile or short-pedunculate, 2.5--5 cm. long, capitate or subcapitate, densely many-flowered, canescent throughout, finally elongating and becoming oblong after anthesis; bractlets linear or linear-subulate, slightly shorter than or equaling the calyx, glandular-pilose, ciliate-margined; calyx tubular, 4--8 mm. long, smaller and shorter than in related species, unequally and acutely 5-fid, strigose on the outside, the 5 teeth subequal and linear; corolla varying from light-pink or flesh-color to white, glabrous outside, its tube half again as long as the calyx, usually about 9 mm. long, pilose in the throat, the limb 5-parted, the lobes obovate, medium in size, emarginate at the apex; dorsal anther-appendages small, included or subequaling the corolla-mouth or slightly exserted.

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EGLERIA, A NEW GENUS OF CYPERACEAE FROM BRAZIL

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EGLERIA FLUCTUANS L. T. Eiten, gen. et spec. nov.

Fluctuans et submersa; caulis principalis crassus paulo ramosus; verticilli caulium gracillorum brevium sterilium ad intervallis 1-5 cm praeter caules principales dispositi; pedunculi crassi in apices caulium principalium surgentes; spicula terminalis solitaria multiflora; glumae indique imbricatae; tertius infimus glumae infimae tubulatus, basim spiculae circumdans; stamina 3; achaenium trigono-compressum obovato-truncatum eburneo-brunnescens, superficie cellulorum isodiametricorum; stylobasis angusta cylindrica, in media parte paulo latior. Ab Eleocharis modo ramificationis et caulibus duabus crassitudinibus et gluma infima spiculam circumdanti differt. A Websteria modo ramificationis et numero florum glumaeque in spicula differt. Habitat in Brasilia, Amazonas, Parentins, Lago José-Assú, in aqua amniculi in tempus repressa propter auctum lacus.

Plant aquatic, with floating stems forming thick masses; main root not seen; main stem (pieces seen up to a few dm long) slightly and irregularly branched, the branches always arising within a whorl of thin stems; internodes 1-5 cm long, 1.5 mm wide (as pressed in herb.), stems terminating almost always in an inflorescence, rarely terminating vegetatively in progressively shorter internodes to the tip; each node with a tubular membranaceous sheath 3 mm long and open distally, with lobed edges, but these generally torn and so appearing fringed; from each node a whorl of numerous thin, short, sterile stems arising at the base of and outside the above-mentioned sheath, the whorls in general directed laterally and alternately left and right along the main stem; the thin stems in a whorl 3-7 cm long, 0.1 mm wide, each with a tubular, membranaceous sheath ca. 4 mm long and 0.12 mm wide, with mouth obliquely cut and sometimes elongated into a lobe along the main vein; this whorl subtended by a short, wide, more or less triangular bract, and sometimes also by a few short thin roots; inside the whorl at the base are linear membranaceous fragments, apparently the remains of a bract or sheath that either enveloped subclusters of stems within the whorl or formed a second more basal sheath around each individual thin stem; the thin stems of one whorl more or less grouped in separate subclusters, some of which bear at the base a delicate enveloping sheath that has not yet fragmented; peduncles in apical groups of 2-6, each group including peduncles that arise from one or more points among a close series of a few terminal appressed nodes, each point subtended by flat or partially tubular bracts (from other points in the same apex arise shoots of few to numerous thin stems like those in the lateral whorls); peduncles 5-8 cm long (not including spikelet), 0.6-0.8 mm wide, with tubular sheath 1.2-2.0 cm long and 1.0 mm wide, and with a shorter, more basal, enveloping bract, and occasionally with a few thin roots at the very base outside this bract; spikelet linear to linear-lanceolate, 7-10 mm long, 1.0-1.5 mm wide, with 12-15 glumes; basal glume 2.5 mm long, always closed (i.e. tubular) in its basal third, completely enveloping the spikelet base; the other glumes more or less rectangular, 2.5 mm long and half as wide; all the glumes thin, reddish-brown, frequently with longitudinal central part greenish-gray, the edges very thin, transparent and colorless; all glumes, *including the lowest*, fertile; stamens 3, lying appressed side by side between the pistil and the glume; filament not yet elongated, almost 0.5 mm long, swollen at connection to anther; anther linear, 1.2-1.3 mm long, including the extended 0.07-0.09 mm long connective; pistil in flower 5 mm long, the style and three long stigmas flat and ribbon-like, the stigmas with lateral spaced papillae; achene (the maturest seen) flattened-trigonous, almost appearing lenticular, obovate-truncate with persistent cylindrical stylebase, the achene (not including stylebase) 1.1 mm long and 0.8 mm wide, the stylebase 0.65 mm long and 0.16 mm wide, widest in middle, narrowed where joins achene; achene brownish ivory, surface with isodiametric, more or less cancellate cells, this surface texture and color also covering base of stylebase, the rest of the stylebase smooth and somewhat darker; bristles 5 (in the achene seen), with retrorse barbs.

Type- A. Ducke s/n, 29 December 1935, Brazil, Amazonas, Parentins, Lago José-Assú, "cabeceira grande, no riacho corrente porem cuja agua é durante algum tempo represada pela enchente do lago" ("large headwaters, in a running brook whose water is held back for the time being by a rise in the water level of the lake"). Holotype in herb. Univ. Brasília; isotypes M, NY, RB (acc. no. 34609), SP.

The previous description was based on the type collection only. The paratype collection is similar, differing in the following particulars: internodes 4.2-8.5 cm long and 1.0 mm wide; sheath on thin sterile stems 3.0-3.5 mm long; thin roots present in almost all whorls; peduncles 2-15 in a group, 9.5-15.2 cm long, with sheath 1.1-1.8 cm long; spikelets 8-9 mm long, 1.0-1.1 mm wide, with 10-12 glumes; filaments elongated, very long, thin and transparent, anthers past anthesis, mostly fallen. A. Ducke s/n, 20 July 1912. Brazil, Pará, Obidos, Enseiada da Cabeceira grande do Lago Sapucuá. "Fluctua e cobre uma superficie consideravel" ("floating and covering a considerable surface"). Holotype in herb. Univ. Brasília; nearly 50 isotypes will be sent to herbaria in all parts of the world.

The genus is named in honor of the memory of Walter Alberto Egler, director of the Museu Goeldi in Belem, Pará, who made notable collections and valuable observations on the vegetation of the Brazilian Amazon.

The relationships of *Egleria* are with *Eleocharis* and *Websteria*, differing in the details shown in Table 1. It is like *Eleocharis* in the spikelet and achene, and like *Websteria* in forming floating masses and in the two contrasting forms of stems, the thick, fertile peduncles (which are probably held above the water surface) among a mass of thin, sterile, floating stems. *Egleria* can be imagined to have evolved from a branched rhizomatous species of *Eleocharis* which had spaced, erect stem clumps at intervals. The rhizomes became the main stems of *Egleria*, the culms of the clumps became sterile, and the fertile stems (peduncles) remained to arise only at the tips of a main stem branch that stopped growing. *Websteria* apparently evolved directly from *Eleocharis* also, but from another part of the genus. Both *Egleria* and *Websteria* became adapted to a floating existence; apparently in both the mass of thin stems helps the plant to float in still water or a current and supports the emergent thick peduncles.

I would like to thank Dr. George Eiten for his criticism of the manuscript of this article and for his translation of it into English. I wish to thank the Jardim Botânico do Rio de Janeiro for putting the material studied at my disposal.

The illustrations are all from the type collection, almost all, including the achene, from the holotype.

Table I

	ELEOCHARIS	EGLERIA	WEBSTERIA
Habitat	Terrestrial in moist to soaking soil, or with base in water, or completely submersed & rooting in substrate, or mass of plant floating.	Mass of plant floating. (Base of plant and roots not seen.)	Mass of plant floating, clumps rooted in substrate.
Habit	Separate small or large clumps, or small clumps or individual culms arising along a rhizome (rhizome about same diameter as culms). In a few species a culm (with or without a spikelet) bearing a small, terminal, sometimes rooting shoot.	Main stem thick, branched slightly & irregularly. Whorls of thin short stems arranged along the main stem.	Clump of many stems from base, all or most of these (eventually) with whorls of stems at their tips, these with further whorls at *their* tips, etc., for several branch orders. The stems become thinner & shorter the higher the branch order.
Fertility of stems	All culms (eventually) bearing terminal spikelets. Some completely submersed forms are completely sterile or have more sterile culms than fertile ones.	Relatively few thick fertile stems (peduncles) in relation to large number of thin sterile ones.	*Same as Egleria*.
Spikelet	Few-many-flowered; spiral, rarely distichous. Lower glume(s) sterile. Very rarely 1-flowered between 2 large glumes.	Spiral; many-flowered, all glumes fertile (or at least, all glumes with flowers).	1-flowered between 2 large glumes.
Seed	With stylebase.	With narrow stylebase.	Without distinct stylebase. Apex of achene extends in a pointed cylindrical prolongation.

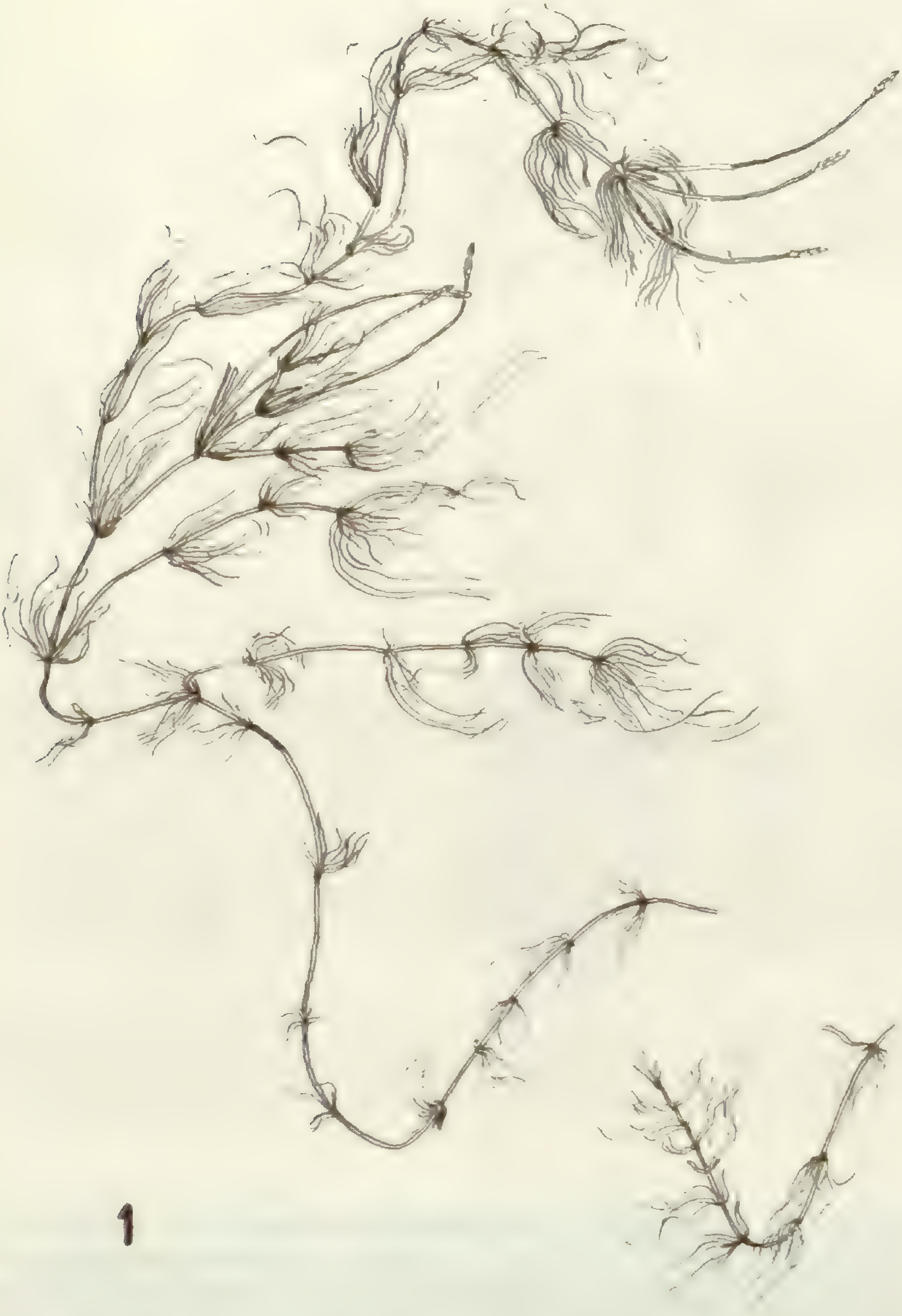
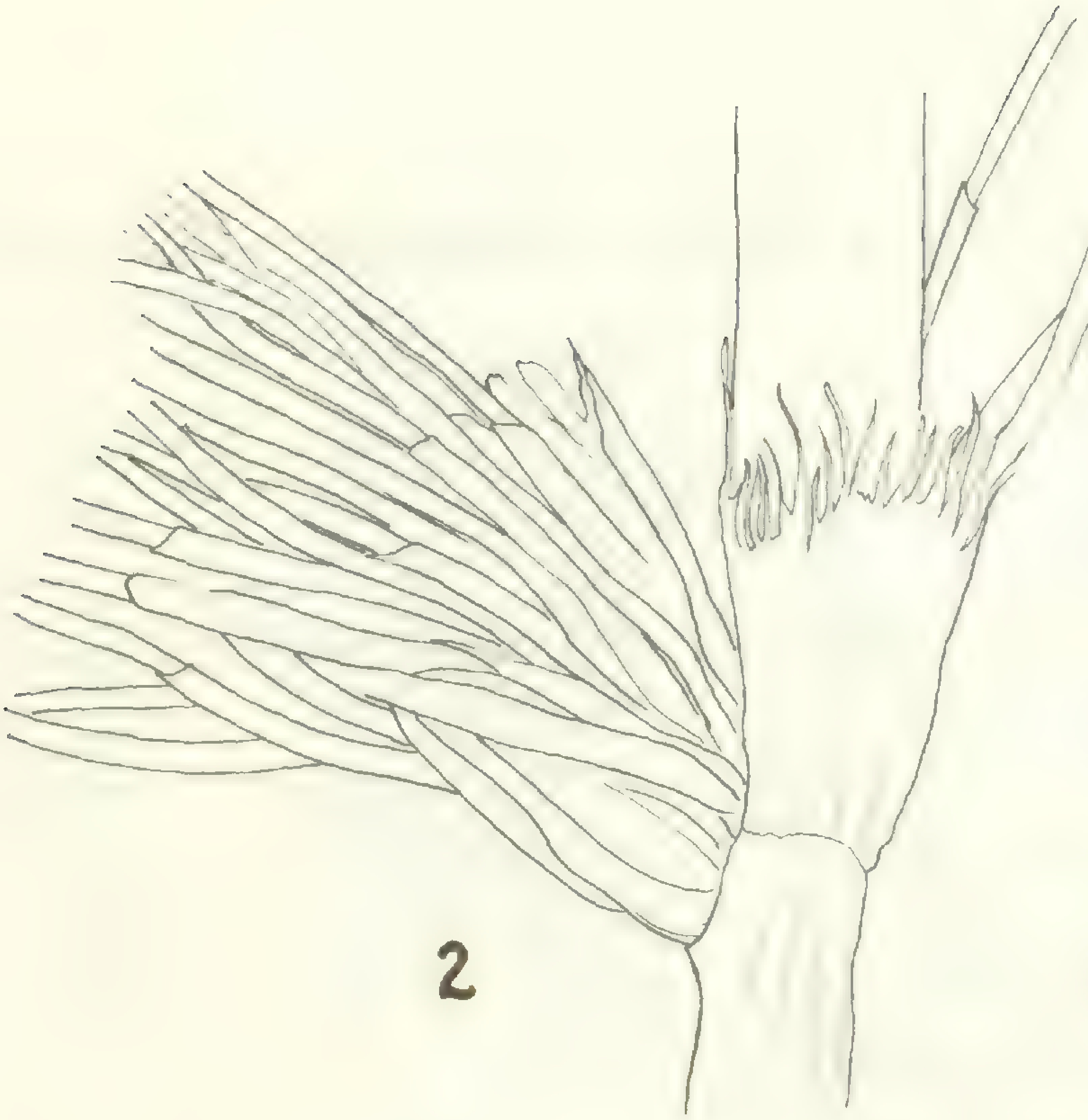


Fig. 1. Habit of *Egleria fluctuans* (slightly less than half natural size) showing branched main stem with whorls of thin sterile stems arising at nodes. The main stem branches terminate either with a group (simulating a whorl) of thin sterile stems and thick peduncles, or of successively crowded thin sterile stem whorls.



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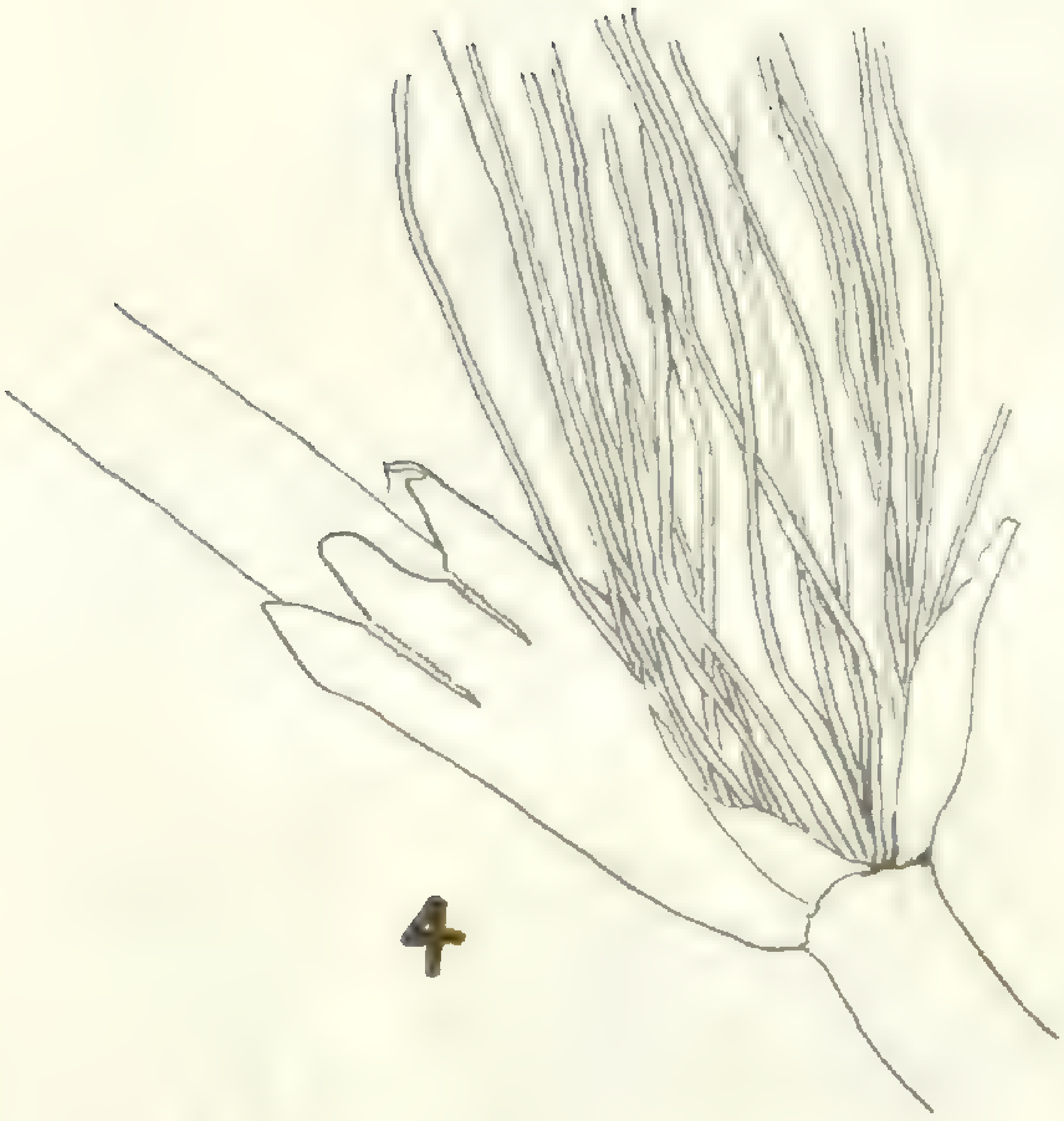

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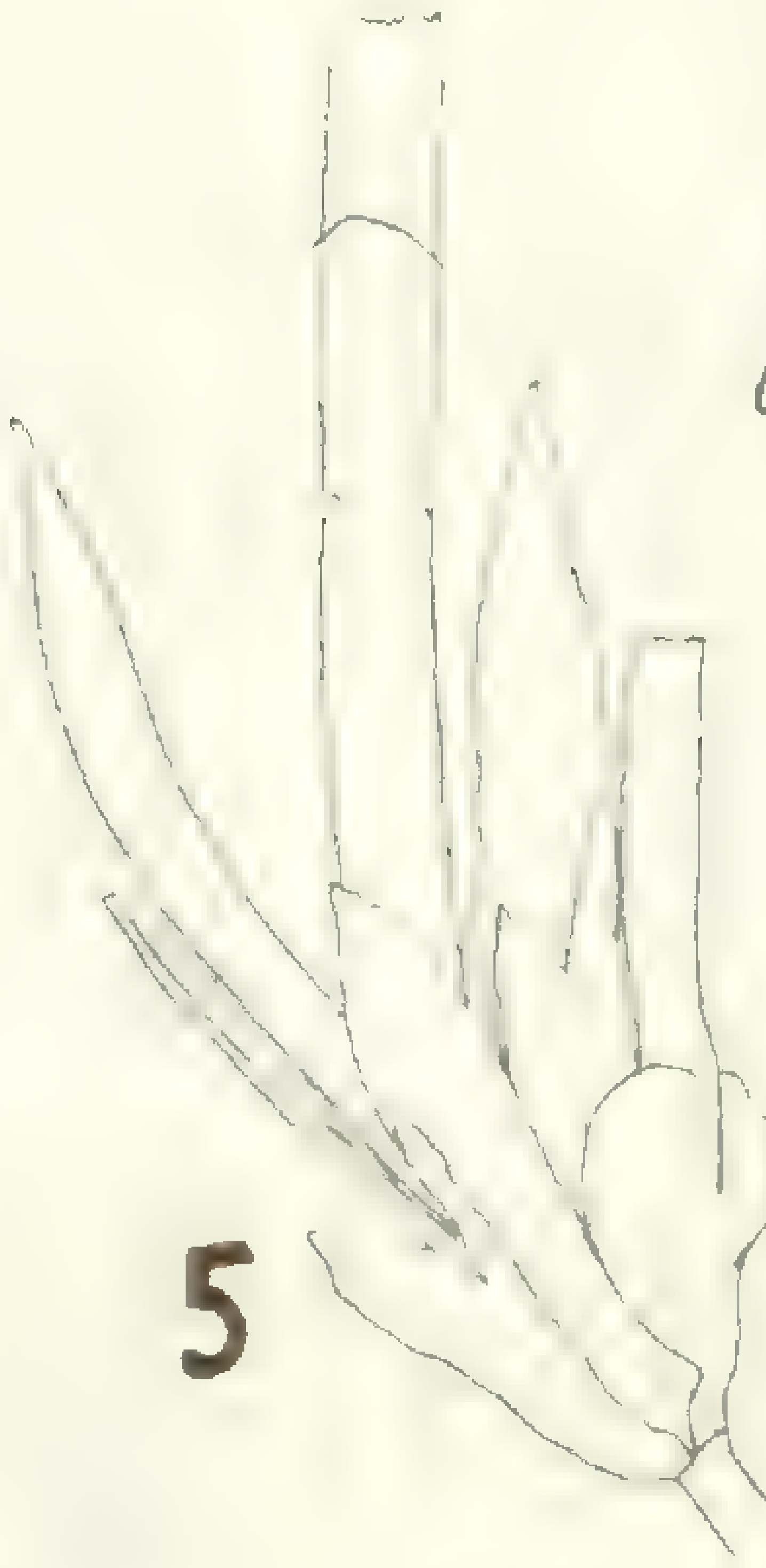

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Fig. 2 Detail at node of a main stem (x15) showing tubular sheath with fringed edge and the base of a whorl of thin sterile stems arising outside of and at the base of this sheath. (The few thin stems to the right are part of the same whorl that have become bent from their true position.)
Fig. 3. Detail of a thin sterile stem (x25) with basal tubular sheath.
Fig. 4. Detail at another node (x10). Lobed edge of main-stem sheath shown beginning to tear. The sheaths of the thin sterile stems not shown here.
Fig. 5. End of a main stem (x4) showing a "group" of points of origin on crowded terminal nodes (hidden by bracts) simulating a whorl. From one point is arising a thick peduncle with tubular sheath and basal clasping bract; from other points are young shoots (probably new peduncles); and from another point at left are two thin sterile stems. One or more bracts subtend the whole group.

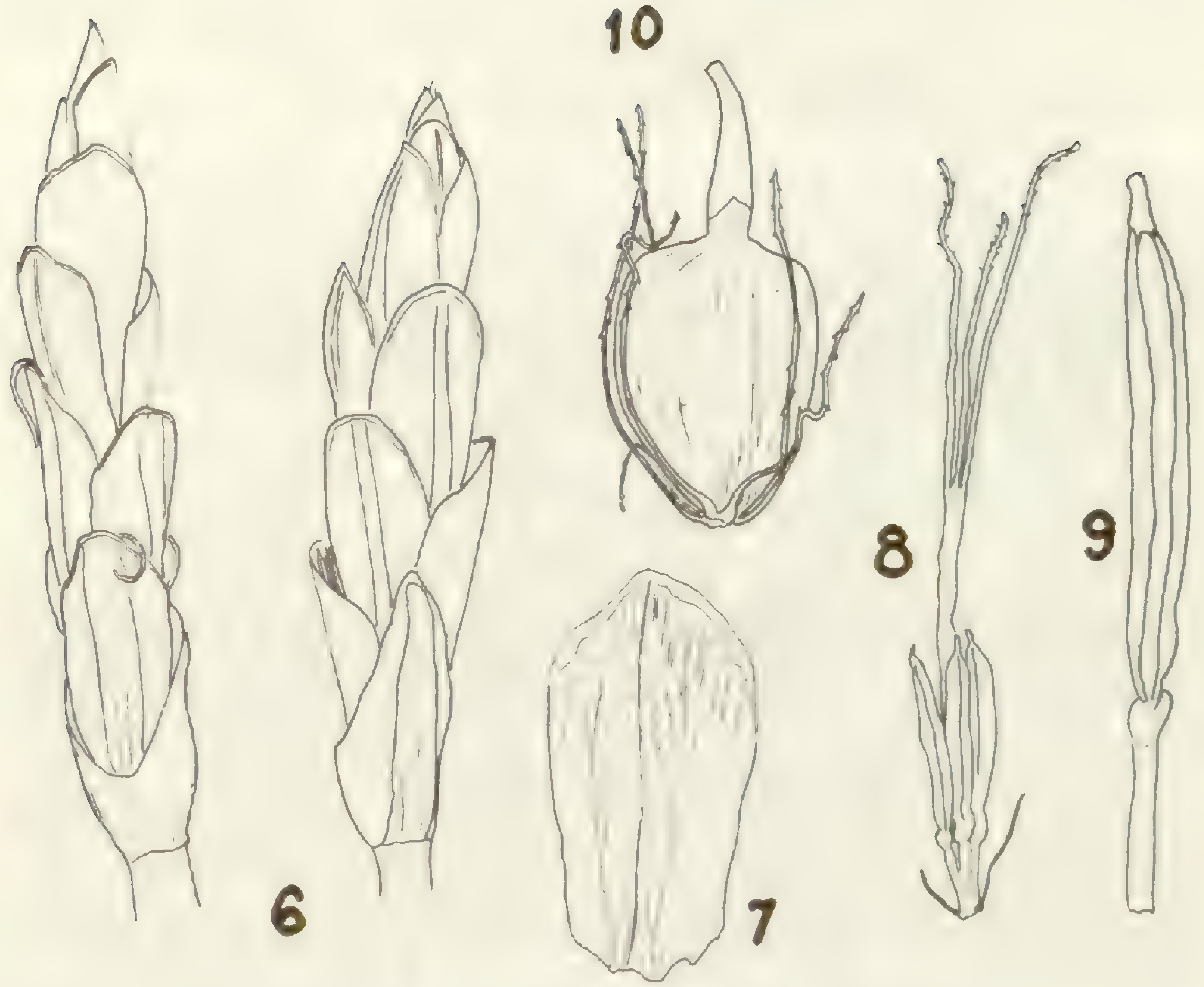

Fig. 6. Two views of a spikelet (x10) showing basal glume tubular and sheathing in lower third.
Fig. 7. Normal glume (not the basal one) spread flat (x15).
Fig. 8. Flower (x15) with three stamens side by side on abaxial side of pistil. The filaments have not yet lengthened nor have the anthers opened. The strap-shaped style and three stigmas are visable.
Fig. 9. Stamen (x42).
Fig. 10. Ripe or almost ripe achene, the only one seen (x25), showing flat side and 5 retrorsely-barbed bristles. Remains of a filament at left.

QUERCUS XCOLUMNARIS LAUGHLIN
CALDWELL OAK

Hibrida nova[1]
Quercus palustris Muenchh. X rubra L.

Erythrobalanus Section
Palustres Series

Kendall Laughlin (1890-)
165 Pine Ave., Chicago, Ill.

Arbor 19 cm. diametro et 14 m. alta columnaris formae cum gracilibus aequis ramis. Cortex fuscus cinereus, confertus, tenuis laevisque. Novi temporis ramuli glabri, angulati, leviter lucidi viridi-brunnei candidis lenticellis, postero anno brunnei. Extremae hiemales gemmae 4.5-5 mm. longae pyramidatae 4-5-angulatae acutae brunneae puberulentes.

Folia plerumque alterna, interdum opposita. Laminae foliorum 8.5-18.5 cm. longae, circiter 15 cm. longae in inferioribus laminis et 12 cm. longae in superioribus laminis, 5.5-14.5 cm. latae, tenuissimae, supra hebetes galbinae et glabrae, subtus pallidiores et leviter lucidae magnis candidis cinereis floccosis cristis in axillis pallidae costae mediae et trium vel quattuor parium nervorum lateralium principalium, superiorum rectorum, inferiorum falcatorum, circumcurrente adumbratione ovales vel obovatae, divisae in 3 vel raro 4 lobos lateralis in utroque latere separatos ellipticis vel interdum rotundis diversis sinibus extendentibus tribus-quartis ad costam mediam, aut apertis inferioribus sinibus in angustis laminis in humilibus surculis; lobi infimi acuti cum aut sine pari lateralium setarum; lobi superiores constantis latitudinis in medio, in apice acuti, cum pari setosorum lateralium lobulorum; lobus extremus 1.2-6.5 cm. latus trilobatus cum 2 lateralibus lobulis, apice acuminato cum 3 setis. Basis concava-cuneata.

Petioli 1.3-4.8 cm. longi, prope rotundi, glabri.

Glandes (15-)17-28 plerumque 24 mm. longae; cupula leviter poculoformis incurva margine, (8-)9-12 mm. alta, (13-)17-22 mm. lata, tecta hebetibus viridi-brunneis arte adpressis imbricatis triangulis puberulentibus squamis, intus glabra; nux viridi-brunnea, candido cinereo tomentulo varia, ovoida, (11-)14-25 mm. longa, (12-)15-19 mm. lata, tribus-decimis vel prope dimidio conclusa in cupula; pedunculus 9 mm. tenus longus, glaber.

Holotypus in Kewensibus Hortis.

QUERCUS XCOLUMNARIS LAUGHLIN

A tree 19 cm. in diameter and 14 m. tall of columnar form with slender horizontal branches. Bark dark gray, close, thin and smooth. Season's branchlets glabrous, angled, slightly lustrous greenish brown with light lenticels, brown the following year. Terminal winter buds 4.5-5 mm. long, pyramidal, 4-5-angled, acute, brown, puberulous.

Leaves usually alternate, sometimes opposite. Leaf blades 8.5 to 18.5 cm. long, averaging 15 cm. long on lower leaves and 12 cm. long on upper leaves, 5.5-14.5 cm. wide, very thin, dull yellow green and glabrous above, paler and slightly lustrous beneath with large light gray floccose tufts in the axils of the pale midrib and the 3 or 4 pairs of primary veins, upper ones straight, lower ones falcate, oval or obovate in peripheral outline, divided into 3 or rarely 4 pairs of lateral lobes separated by elliptic or sometimes divergent sinuses extending three-fourths of the way to the midrib, or open lower sinuses on narrow leaves on low trunk shoots; the lowest pair of lobes acute, with or without a pair of lateral bristles; the upper lobes of constant width in their middle portion, acute at the apex, with a pair of bristle-tipped lateral lobules; the terminal lobe 1.2-6.5 cm. wide, trilobate, with 2 lateral lobules, the acuminate apex with 3 bristles. Base concave-cuneate.

Petioles 1.3-4.8 cm. long, subterete, glabrous.

Acorns (15-)17-28, usually 24 mm. long; cup shallowly cup-shaped with an incurved rim, (8-)9-12 mm. high, (13-)17-22 mm. wide, covered with dull greenish brown closely appressed imbricated deltoid puberulous scales, glabrous inside; nut greenish brown, mottled with light gray tomentulum, ovoid, (11-)14-25 mm. long, (12-)15-19 mm. wide, three-tenths or nearly half enclosed in the cup; peduncle up to 9 mm. long, glabrous.

DISCUSSION

This newly discovered hybrid of the Pin Oak *palustris* Muenchh. and the Northern Red Oak *rubra* L., which has a diameter of 7 inches, a circumference of 1 foot 11 inches and a height of 46 feet, is located about 140 feet north of Devon Avenue and 185 feet southwest of Caldwell Avenue in the Clayton F. Smith Preserve of the Cook County Forest Preserves in the southeast corner of Section 32 T41N R12W in Niles Township, Cook County, Illinois, U.S.A. It is in a dense woods consisting mostly of Quercus palustris, rubra, alba, bicolor, Tilia americana, Acer rubrum and Ulmus americana and it is at the east end of a colony of palustris. There are back-crosses between columnaris and rubra. The terrain is a generally level glacial plain with low humps and shallow depressions, which are ideal for the development of palustris. The only Erythrobalanus Oak species in the vicinity are palustris and rubra, which are numerous to the west. The Pin Oaks reach a diameter of 27 inches and look like virgin timber.

Palustris is near the northern limit of its range in this locality and hybrids between it and the ubiquitous rubra may be expected. The only other colony of palustris in Cook County is in Sweet Woods east of Thornton in the south part of the county.

Columnaris resembles palustris in its columnar form, smooth bark and slender horizontal branches. Its leaves resemble palustris, but the leaves on low trunk shoots are longer.

The acorn-cups of both palustris and rubra are saucer-shaped, but those of columnaris are shallowly cup-shaped. Most of the nuts of columnaris are like rubra. A few are smaller and range down to the size of palustris.

The cup-scales of the larger type of acorn of columnaris are like those of the champion Xmutabilis Palm.& Steyerm. in Miquoria, shown as the upper acorn in the center of p. 378 of vol. 6 of PHYTOLOGIA; and the relative proportions of the cup and nut of the two are about the same, but the acorns of columnaris are larger. Such similarity would be expected because the phylogenies of columnaris and mutabilis differ only in respect of their closely related parents rubra and shumardii Buckl.

The possibility of columnaris being ellipsoidalis E.J.Hill or related thereto should be dismissed. While ellipsoidalis is a very variable species and sometimes imitates palustris or velutina Lam. in its form or bark, the leaves of ellipsoidalis are thicker and lustrous above, their lobes are deeply divided at their apex into acuminate lobules, they lack large tufts of hairs, and its acorns are typically smaller and narrower. And while ellipsoidalis is generally common in the central and northern parts of Cook County, it is curiously absent from the east side of the North Branch of the Chicago River for several miles south of Oakton Street.

The common name Caldwell Oak is bestowed upon this tree in honor of Billy Caldwell, known to the Indians as Sauganash, son of a British colonel and a Potawatomi Indian, who once owned this tract. The

rnment gave him 1600 acres between Sauga-
and Indian Road northwest of the northern
ary Line as a reward for his influence
ians.
otype will be deposited in the Royal Bo-
s, Kew, England, and an isotype will be
the Chicago Natural History Museum.

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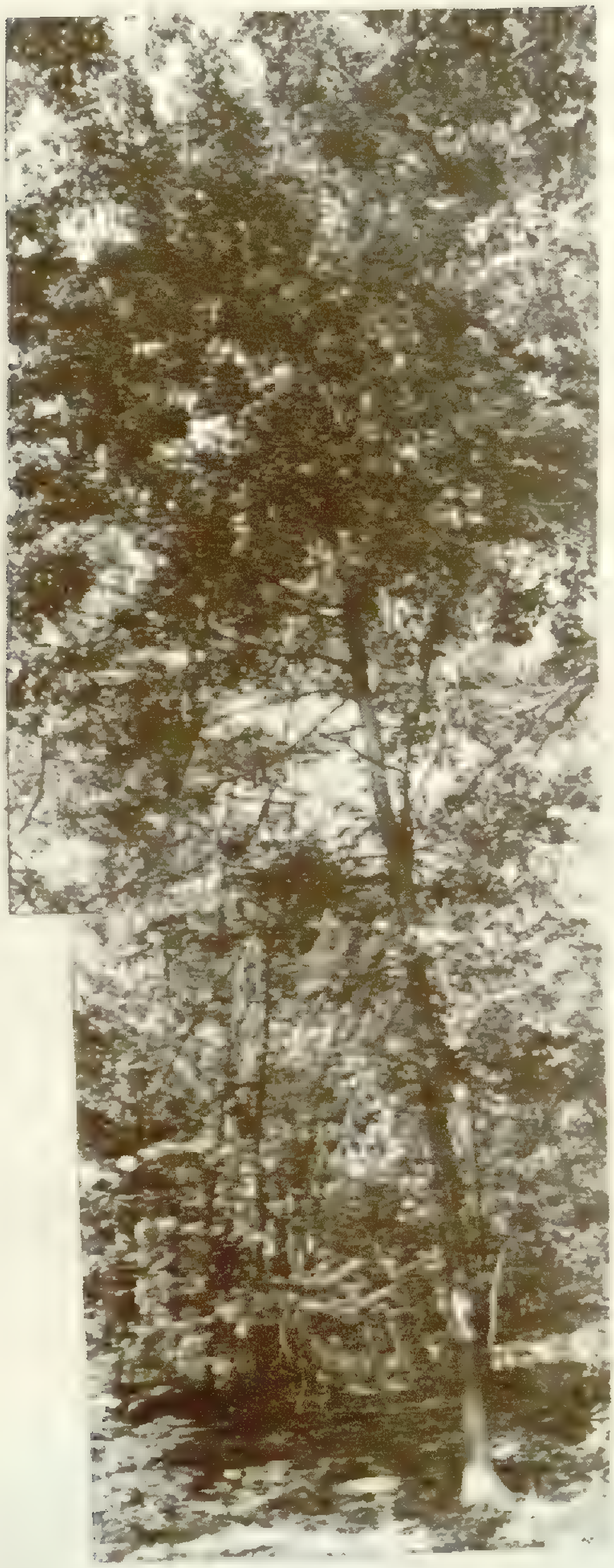
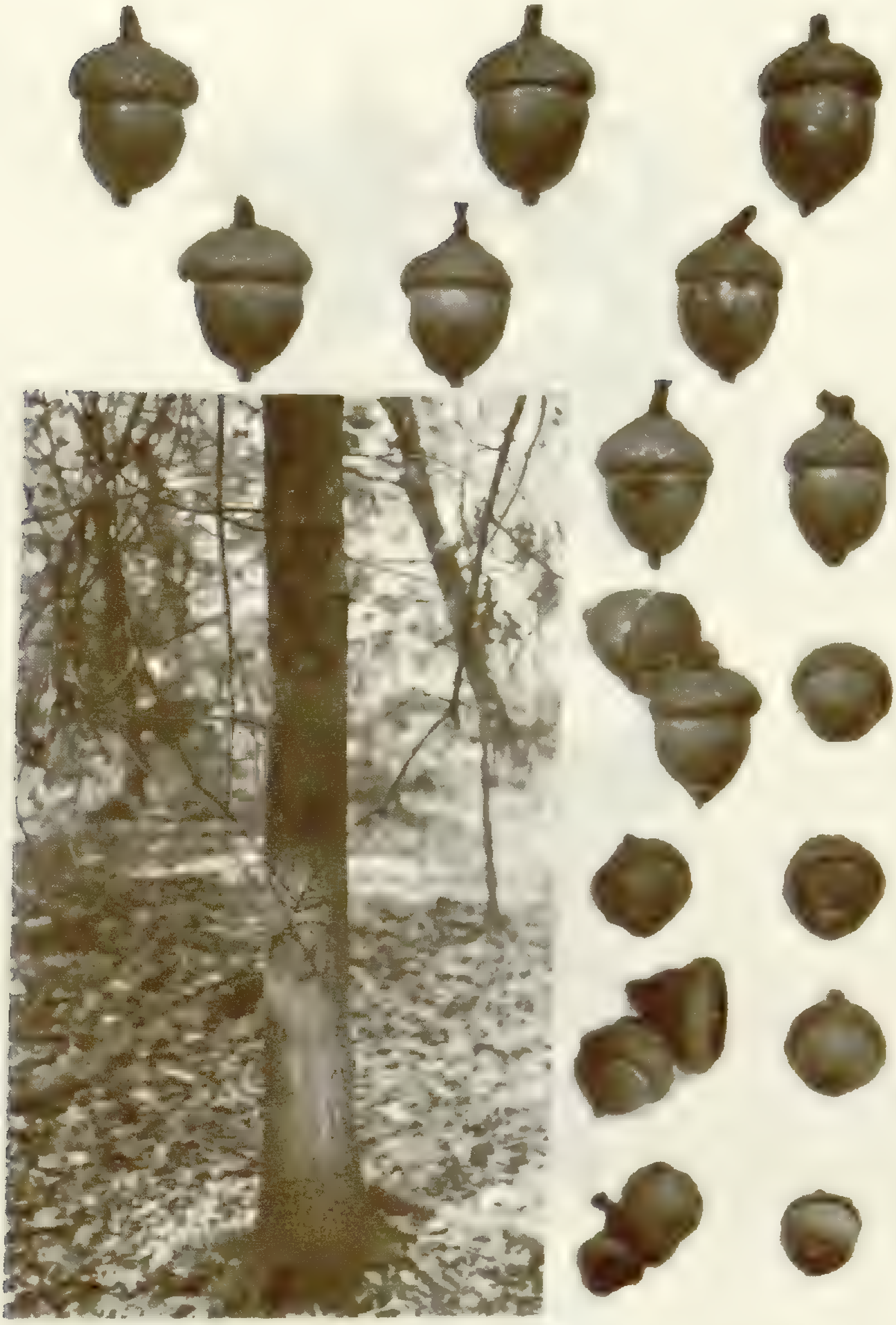
chteri was described as a hybrid of *palu-*
bra by C. G. Baenitz in Allg. Bot.
85 in 1903 from a tree in Silesia. Leon
reya 36:141-2) and E. J. Palmer (A.A.J.
ioned this identification and thought that
ht have been *coccinea* Muenchh. and Palmer
chteri was invalid. *Richteri* is not shown
ame in the U.S.F.S. Check List of Native
zed Trees.



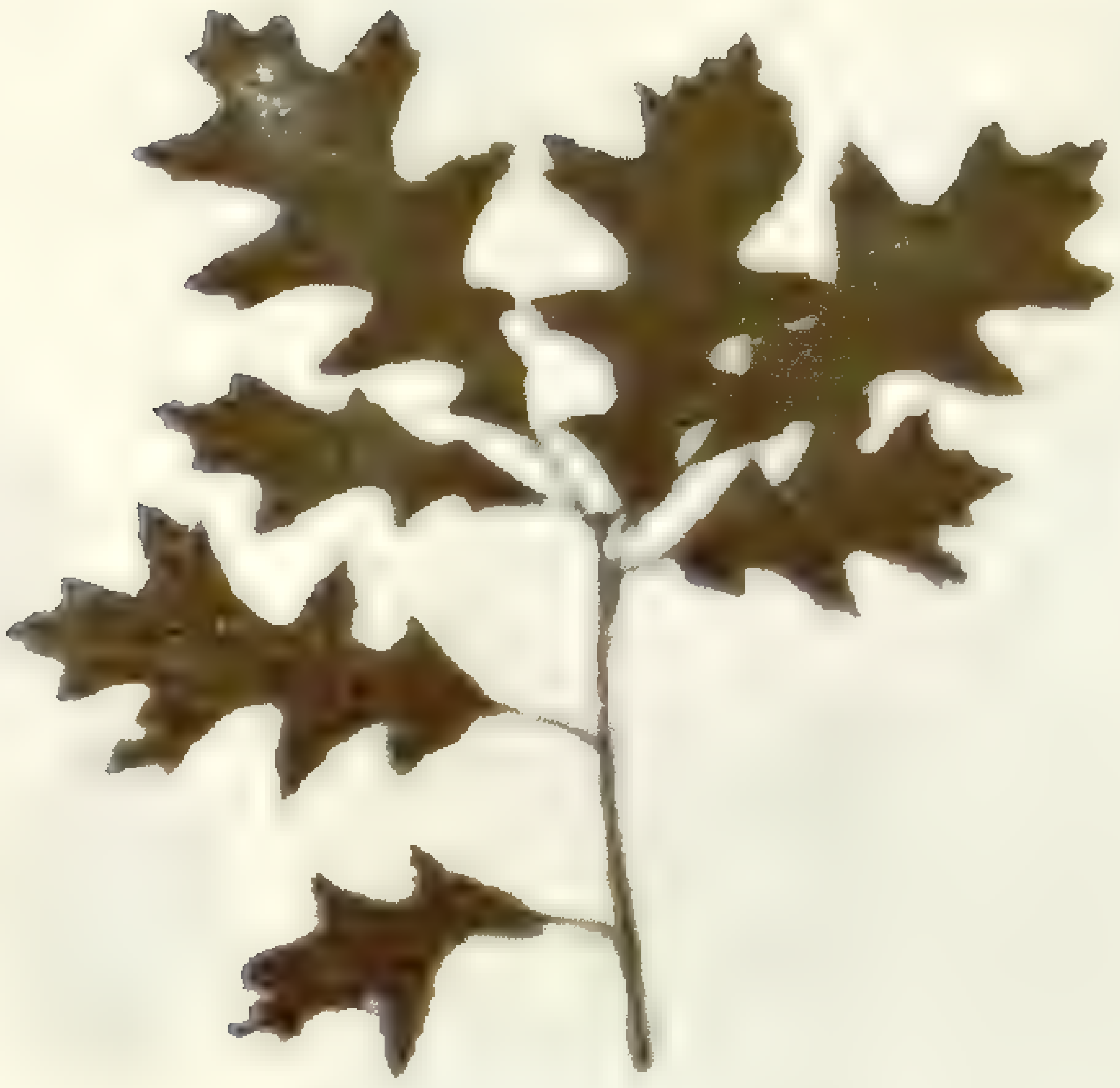
THE TYPE TREE

OF

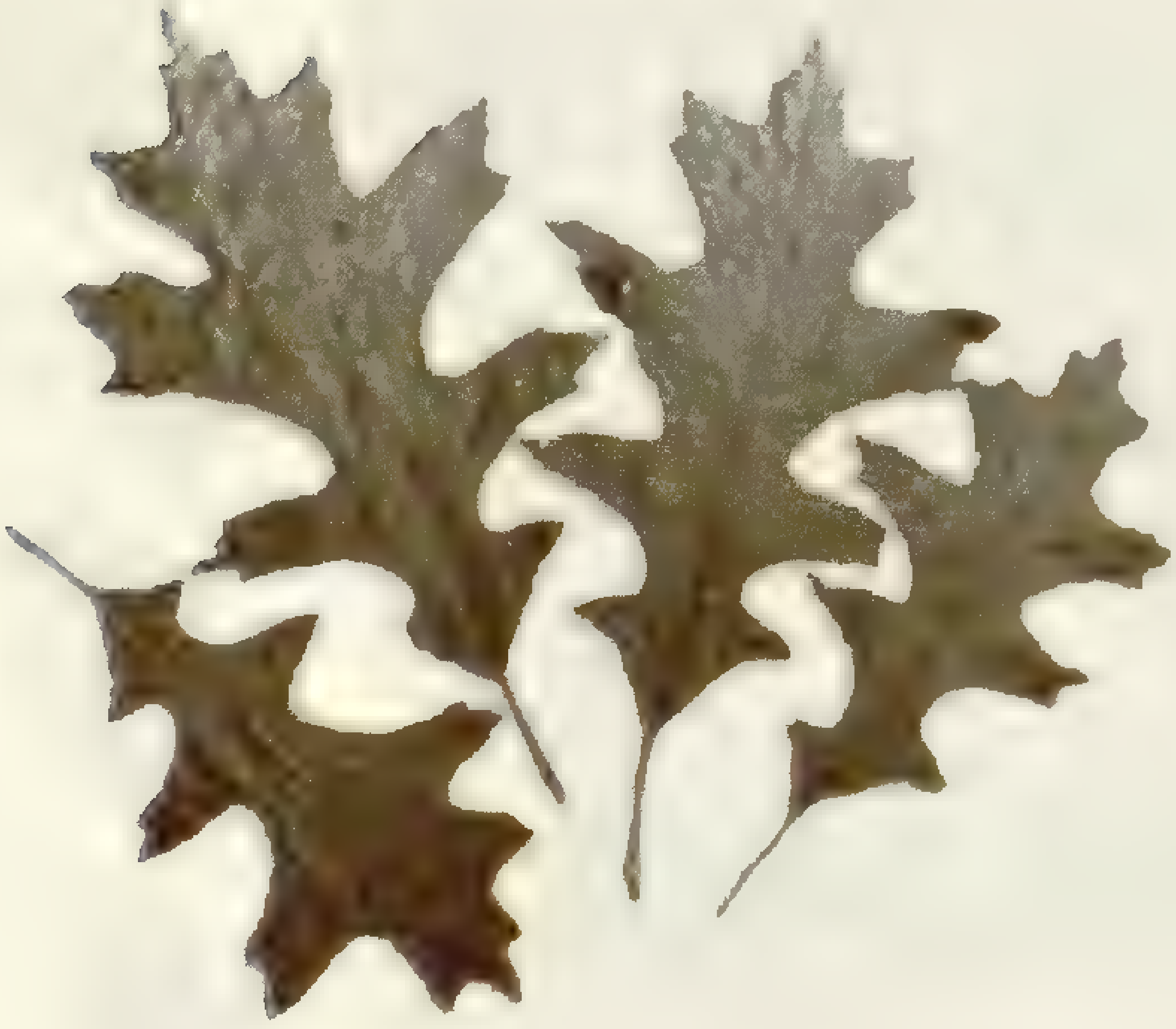
QUERCUS
XCOLUMNARIS



THE TYPE TREE OF QUERCUS XCOLUMNARIS
BARK ACORNS X7/10

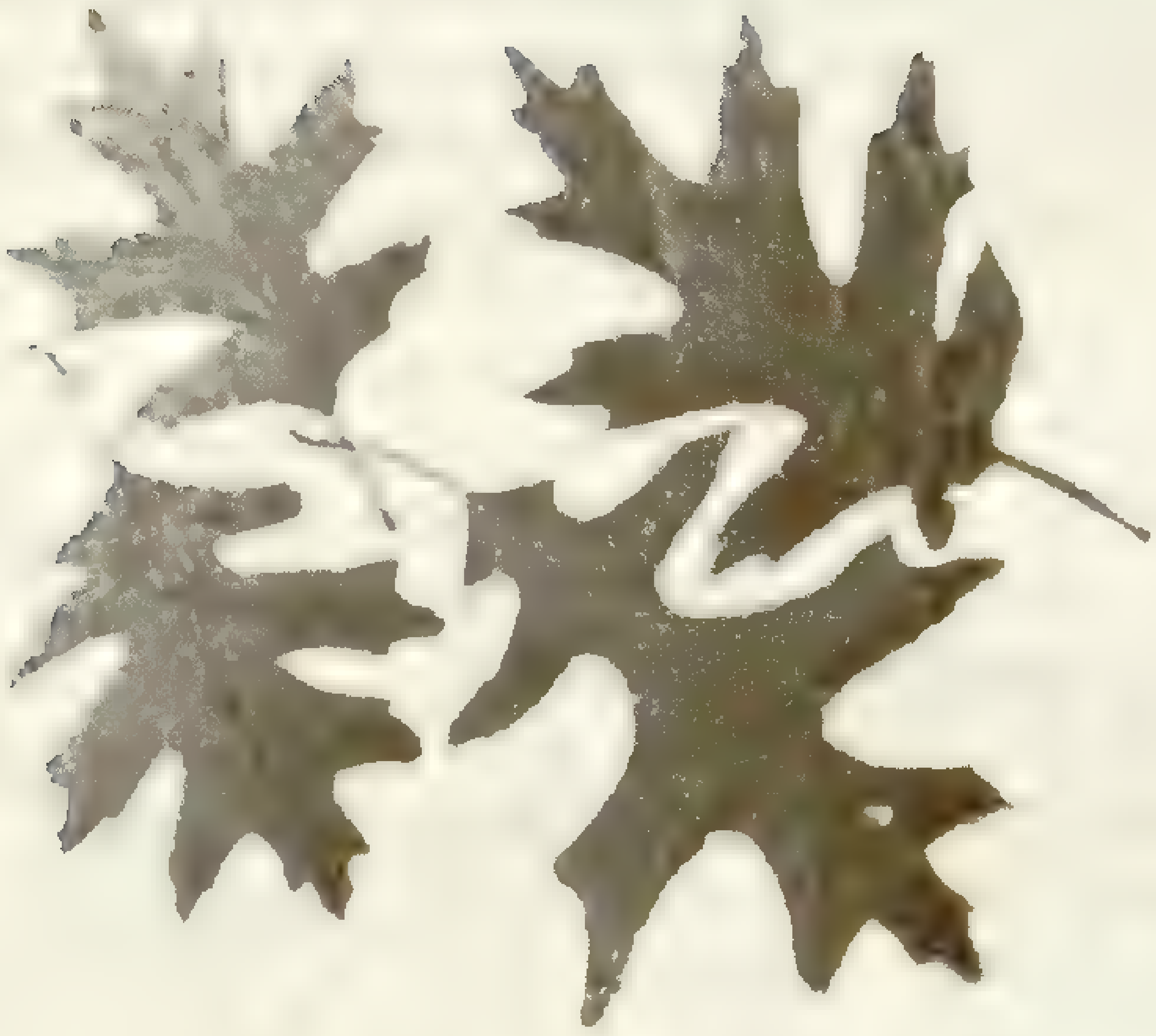


Upper Surface
22% of natural size

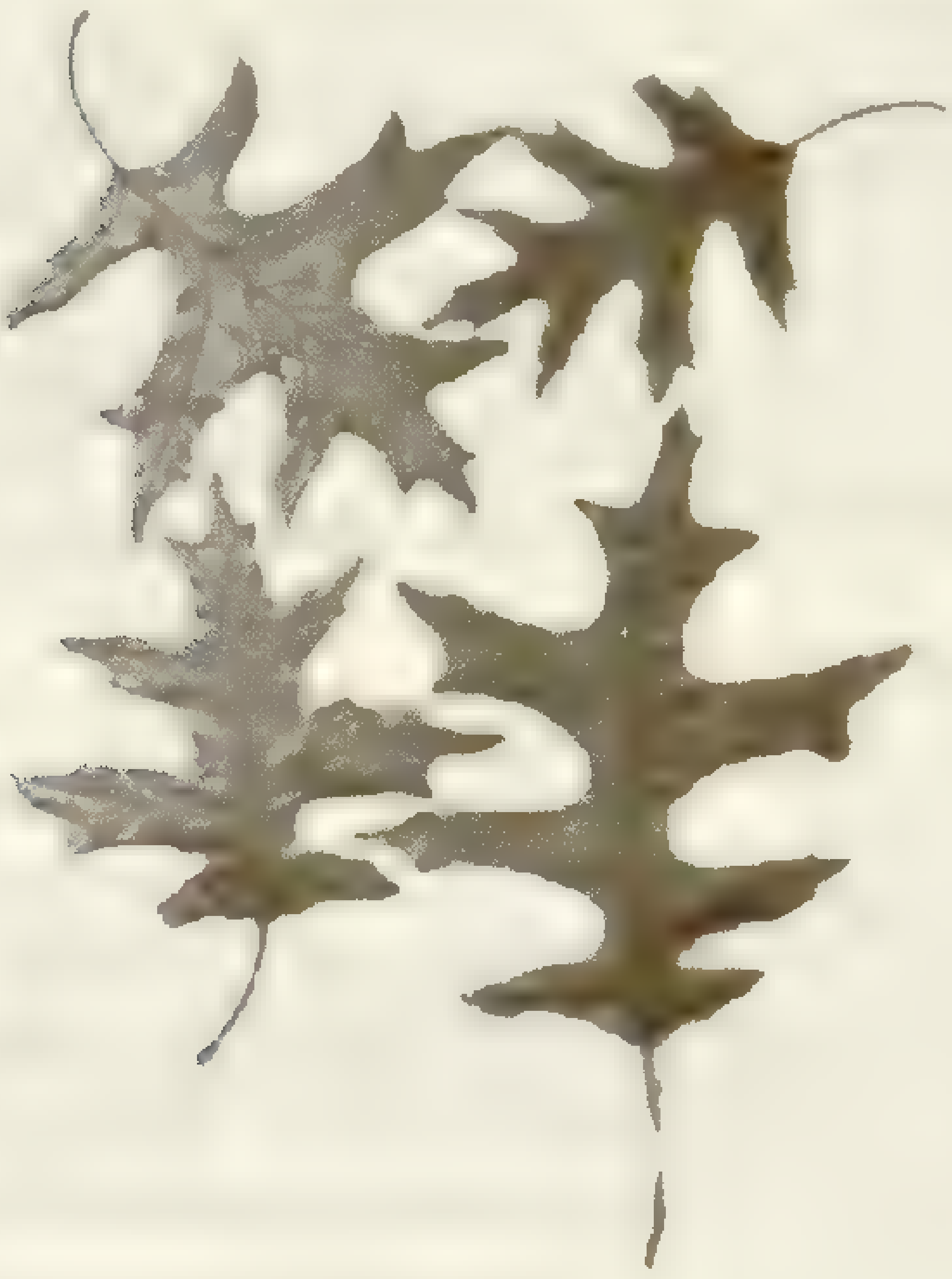


Lower Surface
27% of natural size

LOWER LEAVES OF QUERCUS XCOLUMNARIS



Upper Surface
23% of natural size



Lower Surface
23% of natural size

UPPER LEAVES OF QUERCUS XCOLUMNARIS

THE GENERA SESBANIA AND DAUBENTONIA ON COASTAL CENTRAL UNITED STATES

Clyde F. Reed

The genus Sesbania is represented in central eastern United States by S. exaltata (Raf.) Cory. The distribution given in Fernald (8th. ed., Gray's Manual, p. 902. 1950) and Gleason (Britton & Brown, Illus. Flora, 2: 413. 1952) is Alabama and Florida to Texas, north to Missouri and Oklahoma, being adventive from southeastern Pennsylvania to southeastern New York; also in the southwestern States and Tropical America.

The following are records of adventive specimens of Sesbania exaltata (Raf.) Cory from Maryland and Virginia. The folwers are yellow, mottled with purple; the pods are 10-20 cm. long, about 3 mm. wide, tipped with the elongated slender style, subtended by the persistent calyx. (S. macrocarpa Muhl.).

Maryland: Canton, Newkirk Street, Baltimore, on chrome ore piles. Oct. 14, 1958. Reed 41146. Virginia: Newport News, Warwick Co., on chrome ore piles, quite common. Aug. 7, 1959. Reed 44045; Nov. 15, 1959. Reed 45872.

The genus Daubentonia is represented along the Atlantic Coast of United States by D. punicea (Cav.) DC. (Mem. Leg., p. 286. 1826). The plants from along the Atlantic Coast and the Gulf Coast have gone under several names, as Daubentonia longifolia DC. (Jour. Agr. Res. 20: 507-513. 1920) and Sesbania cavanillesii Watson. Recently, Wilbur (Legum. Plants of North Carolina, N.C. Agr. Exp. Station, Tech. Bull. No. 151, 1963) mapped the distribution of D. punicea in that state.

Daubentonia punicea (Cav.) DC. is a shrub or small tree, with the leaves alternate and pinnate, with 20 to 60 leaflets, which are oblong and pointed; the flowers vary in color from scarlet to yellow (mostly scarlet), in racemes shorter than the leaves; the pods are oblong, 5-7 cm. long, compressed with four wings arising from the margins of the valves and produced beyond the sutures; the seeds are separated from one another by transverse partitions. Very Poisonous to live stock, especially sheep. (Marsh & Clawson, 1920, Jour. Agr. Research, 20(6): 507-513, plate, as D. longifolia DC.; Small, Flora of SE United Steta, p. 615. 1913). Florida to central Texas and Mexico; adventive northward to North Carolina.

North Carolina: Dare Co., Wanchese, Roanoke Island, common in swamps on south end of island, and in everyone's yard, as small trees up to 10 ft. Aug. 28, 1958. Reed 41982. Beaufort Co.: shrub, 5-7 ft. tall, cultivated near Bath. Aug. 17, 1957. Reed 39626. Onslow Co.: sandy wastes, Rt. 172, 6 mi. W of Swansboro. Sept. 25, 1960. Reed 48309. (Used for Cancer Project).

SELAGINELLA DENSA RYDB., AN ILLEGITIMATE NAME

Clyde F. Reed

Selaginella densa Rydb., a species widely distributed in Western North America from southern Alaska, through the western third of Canada down through the Rocky Mountains region of western United States to New Mexico, Arizona and Texas, is illegitimate, being antedated by *S. densa* Hort. ex Sim (1859) for cultivated plants from Brazil. The next available name for our western plant is *S. engelmannii* Hieron., *S. longipila* and *S. haydenii* being reduced to synonyms for the reasons stated below.

Selaginella densa Hort. ex R. Sim, Cat. No. 6: 60, no. 797 (descr.). 1859; Abbey in Journ. Hort. & Cult. Gard. 6: ciii (Descr.). 1864; Spring ex Cz. & Warcz., Cat. Hort. Cracov., p. 13 (nomen). 1864; Nicholson, Dict. Gard., 3: 409 ("a garden name for *S. apus*"). 1887. (Brazil). This same name was also used by Lauche, Verzeichniss Hort. Augustin., p. 8 (nomen). 1856; Hort. ex A.Br., Ind. Sem. Hort. Berol., App. p. 23 (sub *S. apus*). 1857; Backh. Cat., p. 22. 1857.

Hieronymus (Hedwigia 39: 291-296, Dec. 28, 1900) described three new species, all of which refer to the same species, *S. densa* Rydb.

SELAGINELLA LONGIPILA Hieron. (l.c., p. 291) is discarded because the locality given for this species by Hieronymus is "Himalaya" and "Bhotan", even though the specimens (Tryon, Ann. Missouri Bot. Gard. 42: 70. 1955) are actually *S. densa* var. *densa*. Tryon selected as type, Saskatchewan, Fort Carlton, *Bourgeau*, Mar. 29, 1858. *Selaginella longipila* of authors, as Alston (Proc. Nat. Inst. Sci. India, 11: 214. 1945) is *S. indica* (Milde) Tryon from Nepal, Bhutan and Khasia.

SELAGINELLA HAYDENII Hieron. (l.c., p. 296) is discarded because there is some confusion over the type localities, and those given are very general. Originally, Hieronymus gave "Nebraska", Black Hills, *Hayden* 1853-54 (B); *Hayden* ex NY, 1859, in US; paratype: Oregon (then Washington), *Lyall* (B; fragm. in NY).

SELAGINELLA ENGELMANNII Hieron. (l.c., p. 294), based on a specimen from Colorado is the most acceptable name to replace *S. densa* Rydb.

Several of our floras from western United States have used *S. densa* Rydb. for this species. Rydberg in his Flora of the Rocky Mountains reduced *S. engelmannii*, *S. bourgeauii* and *S. haydenii* Hieron. to *S. densa*. Also Rydberg placed *S. columbiana* A.A.Eaton under *S. montanensis* Hieron. (l.c., p. 293). However, *S. columbiana* A.A.Eaton belongs under *S. scopulorum* Maxon and *S. montanensis* Hieron. belongs to *S. wallacei* Hieron. (l.c., p. 297). Broun (Index to North American Ferns, p. 159. 1938) maintains *wallacei* over *S. montanensis* Hieron. Tryon places *S. bourgeauii* Hieron. under *S. rupestris* (L.) Spring.

During my studies of *Selaginella* several collections and localities in addition to those given by Tryon (1955) help to fill in the distribution of *S. engelmannii* and its varieties. I wish to thank the curators in the following herbaria for permitting me to annotate the specimens in theit herbaria: Univ. of South Dakota (SDU); Univ. of North Dakota (NDA); Univ. of Southwest Louisiana (USWLA); Univ. of Delaware (U.Dela.); Univ. of Connecticut (CONN); Herb. of Fish & Wildlife Service at Patuxent, Maryland. Specimens in the Reed Herbarium are indicated by REED and those in the United States National Herbarium by US.

SELAGINELLA ENGELMANNII Hieron., Hedwigia 39: 294, no. 5. 1900 (Dec. 28). Colorado near Empire City. *G. Engelmann*. Aug. 27, 1874 (B, holotype; US).

SELAGINELLA ENGELMANNII VAR. ENGELMANNII

Syn.: *S. densa* Rydb., Mem. N.Y. Bot. Gard. 1: 7. 1900, non *S. densa* Hort. ex Sim, 1859. Montana, Little Rocky Mountains, *Dr. V. Havard*, 1889 (NY, holotype; fragm. at US; paratypes: *Newberry*, NY; *Williams* 534; *Tweedy* 172; Montana, *Mrs. Jennie Moore*). (*Watson* in 1880, GH is *S. wallacei* Hieron.).

S. densa var. *densa*; Tryon, Ann. Missouri Bot. Gard. 42: 68, fig. 44, 45, 47, map 45. 1955.

S. longipila Hieron., Hedwigia 39: 291. 1900 (Dec. 28). Saskatchewan, Fort Cartlon, *Bourgeau*, Mar. 29, 1858; Hb. Kew Exs. No. 1239 (B, NY, P, US, YU), wrongly labeled "Himalaya", B; paratype: Hb. Griffith, Bhotan, B; fragm. NY. Tryon (l.c., p. 70) states that the type specimens of Hieronymus species, *S. longipila*, are actually *S. densa* var. *densa*.

S. rupestris forma *longipila* A.Br. ex Hieron. ex Hedwigia 39: 291. 1900 (in syn.).

S. haydenii Hieron. in Hedwigia 39: 296 (as *haydeni*). 1900 (Dec. 28). (Lectotype: S. Dakota, Black Hills, 1853-54. *F.V.Hayden* (B,Mo, NY, US); paratype: "Oregon", 49 N. Lat., 1858-59. *Lyall* (B, NY).

S. rupestris var. *densa* (Rydb.) Clute, Fern Allies, 142.1905.

S. rupestris forma *engelmannii* (Hieron.) Clute, in Fern Bull. 16: 52. 1908.

S. rupestris forma *haydenii* (Hieron.) Clute, in Fern Bull. 16: 52. 1908.

Canada (Manitoba, Saskatchewan, Alberta, British Columbia); United States (Montana, North Dakota, South Dakota, Oregon, Wyoming, Colorado, Nebraska).

Saskatchewan: St. Lazaire, sandy open soil. July 21, 1961. *B.deVries* 786 (REED); Swift Current, dry prairie, growing in all bare places. June 24, 1947. *A.J.Breitung* 4024 (DAO, REED). Manitoba: Spruce-cactus sand hills, 3 mi. SSW of Carberry. May 15, 1954. *Askell & Doris Love* 6259 (NDA, REED). Colorado: Pikes Peak. Aug. 8, 1903. *John L. Sheldon*. (WVa, REED). Montana: Abundant on short grass prairies, 2 mi. S of Dagmar, Medicine Lake, Nat. Wildlife Refuge, Sheridan Co. Aug. 10, 1943. Neil Hotchkiss 6931 (Fish. & Wildlife, Patuxent); Middle Creek, Gallatin Valley. July 4, 1898. J.W.Blankenship. (NDA, REED). Nebraska: Prairie covered hillsides at Atkinson Lake Rec. Area, Atkinson, Holt Co. Sept. 21, 1960. John W. Thieret 6325. (USWLa, REED); North Dakota: Dry prairie, Towner, McHenry Co. Aug. 1902. L.R.Haldron 2337. (NDA); Towner, McHenry Co. Aug. 12, 1908. Dr. J. Lunell. (CONN, REED); 15 mi. S of Towner, McHenry Co. July 11, 1955. O.A.Stevens 1535. (NDA); dry prairie, E of Marmarth, Bowman Co., alt. 854 ft. June 11, 1952. Robt. T. Clausen 8200. (NDA, REED); dry prairie, Epping, Williams Co. Aug. 14, 1941. O.A.Stevens. (NDA, REED); on rocky slopes of butte, Sentinel Butte, Golden Valley Co. Sept. 13, 1911. H.F.Bergman 1158. (NDA,REED); top of rocky hill, Powers Lake, Burke Co. June 30, 1946. O.A.Stevens. (NDA); prairie openings in oakwoods, Killdeer Mts., Dunn Co. July 12, 1960. O.A.Stevens & D.R.Moir. (NDA); sandy prairie, Hamm, Eddy Co. July 11, 1959. O.A.Stevens 2110. (NDA); on gumbo in Bad Lands, Wade, Grant Co. July 12, 1907. W.B.Bell 632. (NDA); dry prairie, Ross, Mountrail Co. July 12,1960. O.A.Stevens & D.R.Moir. (NDA); dry sandy prairie ridge, Akra, Pembina Co. May 27, 1951. O.A.Stevens 1234. (US, NDA); dry prairie at foot of butte, Black Butte, Slope Co. July 14, 1960. O.A.Stevens & D.R.Moir. (NDA); dry rocky hillside, Dickerson, Stark Co. June 21, 1910. H.F.Bergman. (NDA); Minot, Ward Co. July 1, 1909. J. Lunell. (NDA). South Dakota: Slim Buttes, Harding Co. Aug. 20, 1910. S.S. Visher 25. (SDU, REED); common on high Tablelands, Cave Hills, Harding Co. July 15, 1920. W.H.Over & Solem 11358. (SDU, REED); valley near State Game Lodge. June 26, 1924. Arthur C. McIntosh 406. (SDU); hills just W of Deerfield. July 15, 1924. Arthur C. McIntosh A-46. (SDU).

SELAGINELLA ENGELMANNII VAR. SCOPULORUM (Maxon) Reed, comb. nov.

Syn.: S. densa var. scopulorum (Maxon) Tryon, Ann. Missouri Bot. Gard. 42: 67, fig. 43, map 44. 1955.

S. scopulorum Maxon, in Amer. Fern Journ. 11: 36. 1921. (Holotype: Montana, vic. Cracker Lake, Glacier Nat. Pk. Standley 15732 (US); paratypes: listed by Tryon, 1955).

Lycopodium bryoides Nutt. ex Baker, Handb. Fern Allies, p. 35. 1887 (in syn.). (Specimen at Kew; fragm. at NY).

S. columbiana A.A.Eaton ex Maxon, Amer. Fern Journ. 11: 37. 1921 (in syn.). (Evidently based on Shaw 398 and Heacock 235, both from British Columbia).

Canada (Alberta and British Columbia); United States (Montana, Washington, Oregon, Wyoming, Idaho, Utah, Colorado, California, Texas, Arizona and New Mexico).

Montana: Swift Current Trail, Belt Mts. Aug. 1925. (no.coll). (U.Dela., REED); Red Rock Falls near Many Glacier, Glacier Nat. Park. July 26, 1926. M.J.Elrod. (U.Dela., REED). Oregon: Rolling ground, 1 mi. E of Black Rock Lookout, elev. 500 ft. Aug. 6, 1944. Daisy Overlander. (Oregon St. Coll. 60691, REED).

SELAGINELLA ENGELMANNII var. STANDLEYI (Maxon) Reed, comb. nov.
Syn.: *S. standleyi* Maxon in Smiths. Misc. Coll. 72(5): 9. 1920. (Holotype: Montana, vic. Sexton Glacier, Glacier Nat. Park. Aug. 7, 1919. *Standley* 17228 (US); paratypes listed by Tryon, 1955).
S. densa var. *standleyi* (Maxon) Tryon, Ann. Missouri Bot. Gard. 42: 71, fig. 46, map 46. 1955.

Southern Alaska; Alberta and British Columbia; Montana and Colorado.

Colorado: Pikes Peak, at timberline, S of Windy Point Section House, 11800 ft. elev. Sept. 3, 1922. *I.M.Johnston* 3908. (US, REED); Intermediate between var. *standleyi* and *var. scopulorum*: neutral sandy soil on sandstone hills just N of Gothic, 9500 ft. elev., Gunnison Co. July 16, 1937. *E.T.Wherry*. (REED).

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NOTES ON NEW AND NOTEWORTHY PLANTS. XL

Harold N. Moldenke

ALOYSIA GRATISSIMA var. PARAGUARIENSIS (Briq.) Moldenke, comb. nov.
Lippia ligustrina var. *paraguariensis* Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 305. 1904.

ALOYSIA GRATISSIMA var. REVOLUTA (Moldenke) Moldenke, comb. nov.
Aloysia lycioides var. *revoluta* Moldenke, Phytologia 3: 108. 1949.

ALOYSIA GRATISSIMA var. SCHULZAE (Standl.) Moldenke, comb. nov.
Lippia ligustrina var. *schulzii* Standl., Field Mus. Publ. Bot. 4: 256. 1929.

LIPPIA HIRSUTA var. GLABRESCENS Moldenke, var. nov.
Haec varietas a forma typica speciei foliis glabris vel glabrescentibus recedit.
This variety differs from the typical form of the species in having the leaves glabrous, subglabrous, or glabrescent beneath.
The type of the variety was collected by Ellsworth Paine Killip, Fred Alexander Barkley, and Brother Julián González Daniel (*no. 39841*) at the edge of a woods along the road from Medellin to Rionegro, at an altitude of 2000 meters, Antioquia, Colombia, on November 17, 1948, and is deposited in the Britton Herbarium at the New York Botanical Garden.

VERBENA CANESCENS f. ALBIFLORA Moldenke, f. nov.
Haec forma a forma typica speciei corollis albis recedit.
This form differs from the typical form of the species in

having white corollas.

The type of the form was collected by C. E. Smith, Jr., F. A. Peterson, and Narcisso Tejeda (no. 3940) in gray to whitish soils with occasional calcareous outcrops and thorn-scrub-cactus cover, at an altitude of about 1500 to 1800 meters, along the Tehuacán-Orizaba highway just above Azumbilla, Puebla, Mexico, on July 18, 1961, and is deposited in the United States National Herbarium at Washington.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XVI

Harold N. Moldenke

VERBENA LIPOZYGIOIDES Walp.

Additional literature: F. Phil., Cat. Pl. Vasc. Chil. 220. 1881.

Fruiting-calyx connivent at the apex; schizocarp half as long as the mature calyx; cocci black or madder-red, oblong, areolate, sulcate on the dorsal surface, subtuberculate above.

Walpers (1845) places this species in his Section Verbenaca, Subsection Inermes, Group Thymoideae, along with V. thymoides Cham. and V. clavata Ruíz & Pav. He describes a variety minima as "foliis simplicioribus trifidis, lacinula media apice plerumque profunde tridentata. -- Habitu multo graciliore recedit foliisque brevioribus vix ultra 3 lin. longis capitulis paucifloris subumbellatis, sed ceterum hanc non diversam esse existimo." He cites no type material for the species, but gives as type of the variety Bertero 1390 from somewhere in Chile. Schauer (1847), however, cites Besser 136 as the only collection of the species seen by him, so it may well be that this should be regarded as the logotype of the typical form of the species. Schauer states that the species is related to V. berterii (Meisn.) Schau. "sed foliis tenuiter multipartitis, spicis sessilibus corollaque glabra distincta."

The species has been collected at 500 meters altitude, flowering in October. Herbarium material has been misidentified and distributed as V. dissecta Willd.; on the other hand, the Claude-Joseph 4013 distributed as V. lipozygioides is actually V. berterii (Meisn.) Schau.

Gay (1849) says "Planta bien distinta de las especies de esta seccion por su color ceniciento, la pequenez de sus hojas y de sus divisiones, por el menor volumen de sus cabezuelas y la forma de sus bracteas. La var. de que habla Walpers no seria por acaso la Verb. Berterii, de la cual sin embargo solo se asemeja por los apendices inclusos de las anteras?"

Acevedo de Vargas (1951) cites: CHILE: Santiago: B. Davila *s.n.* [1869] (Sg--42454) "forma con el tubo de la corola pubescente". Coquimbo: *C. Gay 1085* (Sg--54761). Province undetermined: *Besser 136* [Macbride photos 17427] (Sg--67537--photo of logotype).

Only two herbarium specimens and 2 mounted photographs of the logotype have thus far been examined by me.

Citations: CHILE: Ovalle: *Claude-Joseph 4988* (W--1422113). Santiago: *Grandjot & Grandjot 3975* (N). Province undetermined: *Besser 136* [Macbride photos 17427] (Kr--photo of logotype, N--photo of logotype).

VERBENA LITORALIS H.B.K., Nov. Gen. & Sp. Pl. 2: 276, pl. 137. 1818.

Synonymy: *Verbena litoralis* Humb. & Bonpl. apud Steud., Nom. Bot., ed. 1, 873. 1821. *Verbena litoralis* Humb. apud Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825. *Verbena lanceolata* Willd. ex Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825. *Verbena littoralis* Humb. apud Hook., Bot. Misc. 1: 166. 1829. *Verbena littoralis* Humb. & Bonpl. apud Steud., Nom. Bot., ed. 2, 2: 750. 1841. *Verbena littoralis* Humb. & Kunth apud D. Dietr., Syn. Pl. 3: 600. 1843. *Verbena affinis* Mart. & Gal., Bull. Acad. Brux. 11 (2): 322. 1844. *Verbena bonariensis* β *littoralis* Hook. ex Walp., Repert. Bot. Syst. 4: 20. 1845. *Verbena littoralis* H.B.K. apud Walp., Repert. Bot. Syst. 4: 20, in syn. (1845); Rosengurtt, Estud. Prad. Nat. Urug. 3: 236. 1943. *Verbena littoralis* var.? *glabrior* Benth., Bot. Voy. Sulph 153. 1846. *Verbena littoralis* β *leptostachya* Schau. in A. DC., Prodr. 11: 542. 1847. *Verbena littoralis* Kunth apud Schau. in A. DC., Prodr. 11: 542. 1847. *Verbena bonariensis* var. *littoralis* Hook. apud C. Gay, Hist. Fis. Chile Bot. 5: 21. 1849. *Verbena bonariensis* β *litoralis* Hook. apud Schau. in Mart., Fl. Bras. 9: 189, in syn. 1851. *Verbena nudiflora* Nutt. ex Turcz., Bull. Soc. Nat. Mosc. 36 (2): 195. 1863 [not *V. nudiflora* L., 1808]. *Verbena litoralis* Kunth apud R. A. Phil., Anal. Univ. Chil. 35: 192. 1870. *Verbena litoralis* var. *leptostachya* R. A. Phil., Anal. Univ. Chil. 35: 192. 1870. *Verbena litoralis* var. *leptostaehya* Lorentz, Veg. Nordeste Prov. Entre Rios, ed. 1, 122, sphalm. 1878. *Verbena hanseni* Greene, Pittonia 3: 308. 1898. *Verbena litoralis* var. *leptostachya* Schau. apud Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 292, in syn. 1904. *Verbena bonariensis* var. *litoralis* Hook. apud Reiche, Fl. Chile 5: 283, in syn. 1910. *Verbena litoralis* var. α *pycnostachya* DC. apud Reiche, Fl. Chile 5: 283, in syn. 1910. *Verbena litoralis* var. β *leptostachya* DC. apud Reiche, Fl. Chile 5: 283, in syn. 1910. *Verbena littoralis* L. ex Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1913. *Verbena parviflora* Larrañ., Escritos D. A. Larrañaga 2: 9. 1923 [not *V. parviflora* Ruíz, 1845]. *Verbena littoralis* var. *pycnostachya* Hochr., Candollea 5: 188. 1934 [not *V. littoralis* α *pycnostachya* Schau., 1847]. *Verbena littoralis* var. *leptostachya* Schau. ex Moldenke, Prelim. Alph. List Invalid Names 47, in syn. 1940. *Verbena litoralis* L. ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. *Verbena hansenii* Greene ex Jepson, Fl. Calif. 3 (2): 380, in syn. 1943. *Lippia litoralis* Kunth ex Moldenke, Alph. List Invalid Names Suppl. 1: 14, in syn. 1947 [not *L. litoralis* R. A. Phil., 1896]. *Verbena lotoralis* H.B.K. ex F. A. Barkley, Determin. Ejemp. Herb. Fac. Nat. Agron. Medellin 5: 49, sphalm. 1949. *Verbena literalis* H.B.K. ex Thorne, Castanea 16: 43, sphalm. 1951. *Lippia litorlis* Kunth ex Moldenke, Résumé 314, in syn. 1959. *Verbena arborea* Hort. ex Moldenke, Résumé 357, in syn. 1959 [not *V. arborea* H.B.K., 1948]. *Verbena litoralis leptostachya* Schau. ex Moldenke Résumé 368, in syn. 1959. *Verbena litoralis* var. *pycnostachys* f. *montana* Osten ex Moldenke, Résumé 368, in syn. 1959. *Verbena littoralis* var. *leptostachya* DC. ex Moldenke, Résumé 369, in syn. 1959. *Verbena nudiflora* Turcz. ex Moldenke, Résumé Suppl. 2: 12, in syn. 1960. *Verbena bonariensis* sensu H. Mann, sensu Hillebr., sensu Heller, sensu Forbes, sensu Rechinger, sensu Frear, and sensu St. John & Hosaka apud Degener, Fl. Hawaii. 315: Verbena: Litoralis, in syn. 1960. *Verbena littoralis* sensu Ripperton & Hosaka apud Degener, Fl. Hawaii. 315: Verbena: Litoralis, in syn. 1960. *Verbena litoralis* sensu Fagerlund & Mitchell and sensu Egler apud Degener, Fl. Hawaii. 315: Verbena: Litoralis, in syn. 1960. *Verbena nudiflora* Nutt. sensu Moldenke apud Degener, Fl. Hawaii. 315: Verbena: Litoralis, in syn. 1960. *Verbena littoralis* var. *glabra* Mohr ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. *Verbena litorlis* Kunth ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. *Verbena littoralis* var. *affinis* (Mart. & Gal.) Bourgeau ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963.

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